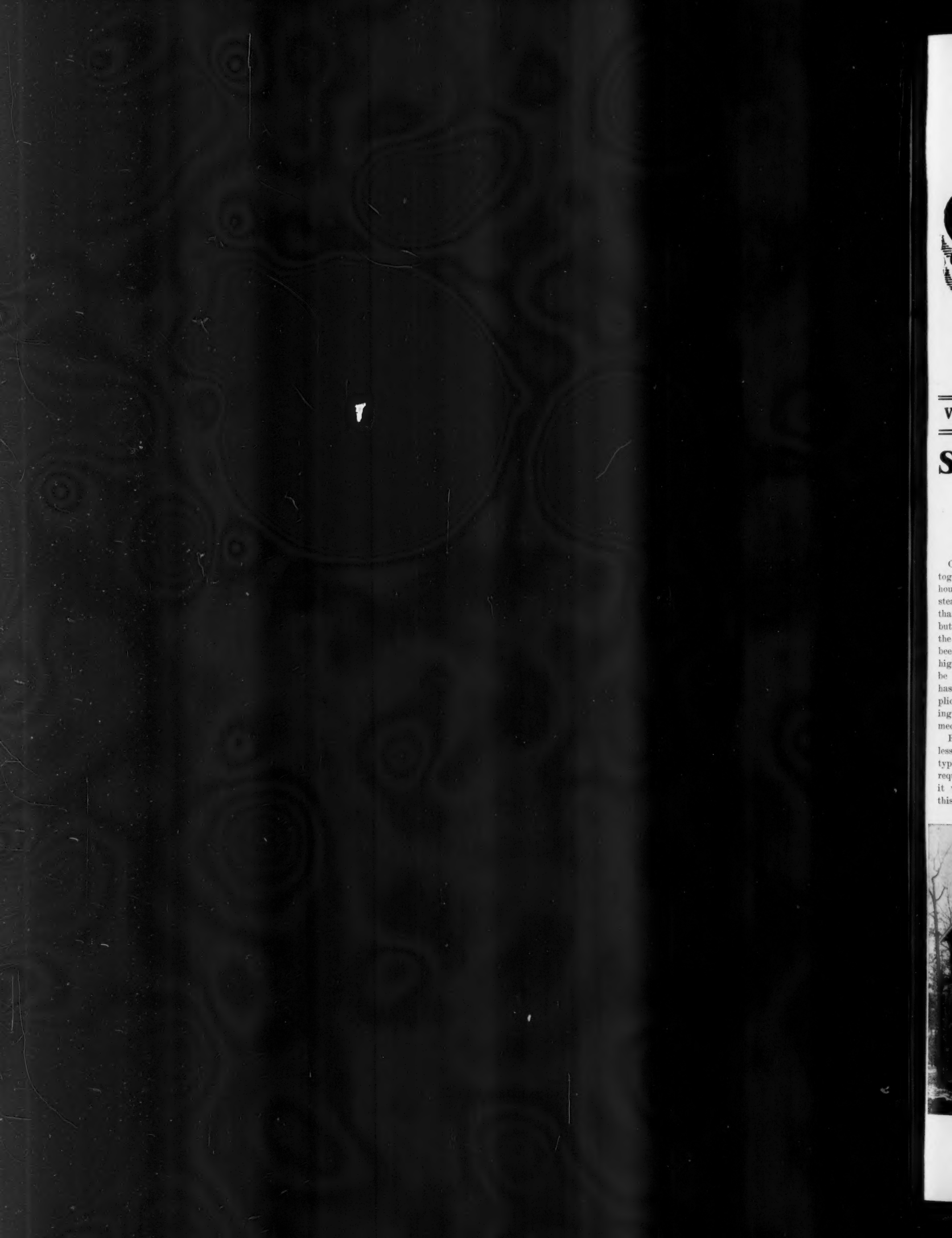
Rock Products

DEVOTED TO

Concrete and Manufactured Building Materials

Vol. VIII. CHICAGO, ILL., MAY 22, 1909. No. 11.



Rock Products

DEVOTED TO

Concrete and Manufactured Building Materials

Volume VIII. CHICAGO, ILL., MAY 22, 1909. Number 11.

SUSPENSION WIRE CONCRETE CONSTRUCTION

Unique System Applicable to Smaller Types of Building, Insure a High Type of Fire Proof Structure.

By M. J. Morehouse, Architect, Chicago.

Owing to the growth of our cities and the massing together of people in flat buildings and tenement houses the demand for fireproof buildings has been steadily increasing. Engineers and builders realize that every owner wants his building to be fireproof, but the whole subject is not generally understood and the earlier methods of fireproof construction have been expensive and almost prohibitive, except for the highest type of building, where excessive rentals can be obtained. Steel frames covered with hollow tile has been used extensively, but it is necessarily a complicated and expensive form of construction, requiring expensive shop work and specially trained mechanics for the erection.

Reinforced concrete column and beam frames are less expensive, but the difficulties met with in this type of building are enormous, and in many cases it requires nearly as much lumber for the centering as it would to erect the entire building, especially is this the case with a moderate sized house.

All such difficulties have been overcome in the new form of concrete building invented by George M. Graham, which is a combination of steel tubing, wire, malleable fittings and concrete. With the exception of piers the concrete is not depended on to carry any of the loads, but is only used as a stiffener or body to the building. The entire framework can be erected before the concrete work is started, making it possible to erect a building in a much shorter time than is required by any other form of construction. The walls and floors are hollow, which reduces the weight of the building to the minimum and makes it warm and sound proof, as every wall or floor contains a continuous air space.

No centering or woodwork of any description is required. The strain on the floors is carried by wires in tension, which is the most economical way steel can be used, and the tests have shown that an equal amount of steel used in this way make a floor of nearly double the strength of any other form of construction. The walls, floors and partitions form one integral mass, so that the building is absolutely vermin proof, and as every partition, floor and ceiling is interwoven with wire it is impossible for cracks to develop.

Such a building is absolutely fireproof and costs very little more than the present form of brick walls, wood floors and partitions, which are so highly inflammable. All steel and wire is encased in concrete, which prevents corrosion or rust, so that the building is indestructible even by earthquake. Cement mortar is plastered directly against the outside of the building, so that any finish or form of ornamentation can be secured very cheaply.

The projectors of this construction have been working on it for several years and have issued and pending thirty-six patents, covering every principle involved. Tests have been made of the strength of each part of the structure, and wonderful results have been obtained.

(Continued on Page 46.)

THE HOME AS COMPLETED.

PROCESS OF LAYING CEMENT PLASTER ON OUTSIDE WALLS.

The Clyde Hydrator

is the accepted standard of highest efficiency, economical operation, positive results and general all around serviceability in hydrating machinery

There are more of them in use than all others put together

They have proven their merit under all conditions
We will furnish full information, booklets and interesting data on your request

"We like to answer questions"

CLYDE IRON WORKS

Manufacturers

DULUTH. MINN.

2300 ft. tunnel at Soldiers' Home, Hampton, Va., built of reinforced concrete, waterproofed through and through with Aquabar and made absolutely moisture-proof. The floor of this tunnel is 3 ft. below water line and is built for the purpose of carrying the heating pipes and electric service to the various buildings. Aquabar was selected by the War Department in preference to all competitors because the PRODUCT IS GUARANTEED.

AQUABAR

The Only absolute and reliable waterproofer, as well as the most economical.

The Only waterproofer that cannot fail to mix thoroughly with cement, insuring absolute waterproofness.

The Only waterproofing compound that crystallizes, and entirely seals the voids between the sand and cement, thus becoming a part of the general mass and waterproofs for all time.

The Only waterproofer that has ever stood the test of sixty pounds pressure to the square inch without effect on a slab of only 3-4 inch thickness.

The Only waterproofer that does not require a skilled workman to mix.

The Only waterproofer that comes already measured for you and all you have to do is to put water in a barrel and dump it in.

The Only waterproofer that can afford to furnish a **Written Guarantee** and even a **Bond** if necessary.

Send for circulars and booklet.

For further information and prices, apply to our agents

The Wisconsin Lime & Cement Company

606 Chamber of Commerce Bldg., CHICAGO, ILL.,

THE AQUABAR COMPANY, 1228 Locust St., PHILA., PA.

ROCK PRODUCTS

ESTABLISHED IN LOUISVILLE, KY., 1902.

DEVOTED TO CONCRETE AND MANUFACTURED BUILDING MATERIALS.

Volume VIII. **CHICAGO, MAY 22, 1909.** **Number 11.**

THE FRANCIS PUBLISHING COMPANY
EDGAR H. DEFEBAUGH, Prest.
Seventh Floor Ellsworth Bldg., 355 Dearborn St., Chicago, Ill., U. S. A.
Telephone Harrison 4960.

EDITORS:
EDGAR H. DEFEBAUGH. FRED K. IRVINE.

ASSOCIATE EDITORS:
BENJ. F. LIPPOLD. HENRY C. WHITTAKER BERNARD L. McNULTY.
JACOB HOLTZMAN, 916 Rothschild Building, Philadelphia, Pa.

Communications on subjects of interest to any branch of the stone industry are solicited, and will be paid for if available.
Every reader is invited to make the office of Rock Products his headquarters while in Chicago.
Editorial and advertising copy should reach this office at least five days preceding publication date.

TERMS OF ANNUAL SUBSCRIPTION.
In the United States and Possessions and Mexico.....$1.00
In the Dominion of Canada and all Countries in the Postal Union..... 1.50
Subscriptions are payable in advance, and in default of written orders to the contrary, are continued at our option.
Advertising rates furnished on application.

Entered as second-class matter July 2, 1907, at the Postoffice at Chicago, Illinois, under Act of March 3, 1879

Gypsum products, such as plaster board and light partition blocks, have steadily gained popularity upon well recognized merit.

Rock crusher men report a very active season both with ballast and road building contracts. Fluxing stone is also more active than it has been for many moons.

Anyway, every concrete contractor and every engineer who makes a specialty of concrete work has got a job and all he wants to take on. Sure, that is a piece of prosperity.

The production of hydrated lime will be practically doubled during the present year. This speaks in no uncertain terms of the merits of the goods or the solidity of the new branch of the lime trade.

The wire mesh type of reinforcement for concrete is becoming more popular every day, for the reason that the greatest efficiency per pound of steel can be had at a lower labor cost. It works on the price two ways at once.

Street work in the big cities is like that classic brook which "runs on forever" in more ways than one. The construction force only reaches the end to start over again, and the concrete mixer has got to be just about as continuous as the brook itself.

Since the business men of the country have become fully convinced that the tariff agitation cannot affect in any way the markets for the great staple commodities during the present year, that much needed element "confidence" has taken a firm seat amongst us. If anybody has not noticed this, it is time to wake up.

The fire losses of the first four months of 1909 have gone beyond all previous records, without making an exception of San Francisco, which was an April incident. This in spite of the fact that the Portland cement industry has found the way to eliminate fire danger or risk. Still more than ninety per cent of the buildings now in process of construction are almost entirely of wood. Worse yet, the overwhelming majority of these wooden buildings are homes for human beings supposed to be intelligent. In spite of all statements to the contrary, it really costs no more to build a safe home now than it does to build a firetrap, and ROCK PRODUCTS is prepared to cheerfully help anybody who can write and read to the fully detailed information for the asking.

If trades unions were to be fully recognized by law, it is possible that they could be legally regulated in the same way that over-powerful corporations are kept within bounds. They should be freely accorded all just privileges and restrained at the boundary line where the rights of other people begin. Although repugnant to our American democratic fundamentals, the re-establishment of the apprentice bondage and rigid trade guilds seems to be the only peaceable solution, and that is what the unions seem to demand, if they know what they are about.

The builders' supply establishments are very busy with the first rush of the season. From such an earnest in hand it is easy to see that 1909 is to be a record breaking year in the building lines. The small sized jobs which were such a prominent feature last year are unabated as to numbers, while the number of very large jobs already at the excavation stage at least doubles the record of one year ago. Two of the largest railroad systems have sounded the trumpet that calls out the engineering department to get busy with the long delayed maintenance and improvement work. Practically all of the railroads will take the same move very soon, because all of them are in great need of a very large amount of work. Structural steel has bumped bottom prices and is on the rebound. Strong markets prevail for nearly every commodity in the list of builders' supplies, as far as the great staples are concerned, and the same thing is true of all the specialties that have become such a prominent part of the retailer's business in recent years. Strong markets invariably attract buyers, and it can be truthfully said that there never was a more propitious season at the outset than the present one. Stocks in the yards and the warehouses of the retailers generally are below normal, and there is now more anxiety at the receiving end than is usual as June 1 approaches. This condition will prevail beyond midsummer, because it is hard for one to realize the full force of actual demand for supplies after there has been so much doubtful talk going around. But the business is on top just the same.

The building department of municipalities should be divorced from politics. The problems involved are practical, and can be handled efficiently by men of experience only; or, else technical, which requires special scientific and artistic training. Few, if a single one, can be found amongst the city politicians who is in any way qualified to serve in such a capacity. One city is no better off than another in this regard. Every politician is created by a clique, and all the members of it have a prior claim upon him to any obligations that may come along with the position he occupies. His opinion is very likely to lean the way his "gang" needs him to lean. It is really very easy. Since he is dealing with complex matters of which he knows absolutely nothing, he inquires of the "gang" who is the best party to ask about this or that point. The "gang" always knows the right party; at least they send the only party that gets consideration, and the peace of that political family is preserved in the ruling or decision that issues. A competent board made up of two architects, two engineers, two contractors and two retailers of materials, appointed for a definite term, with power to elect the chairman from their own number, is available everywhere. Such a board, being well paid for their services and under heavy bonds personally to administer the ordinances impartially to the building public as well as the materials used in construction, would accomplish a great deal of good. The examination and classification of all materials upon an intelligent basis, with ample provision for new improvements, should be a part of the work of such board. Clearly defined standards of structural values should be erected without regard to source of supply or in favor of any special interest or industry. By cutting out the political feature, better and safer buildings, honest materials, costing less yet paying better profits to the men who handle and make them, will result. Very likely this would help the labor situation also. *Selah.*

EDITORIAL CHAT

A. D. Level, of the United States Steel Products Export Company, of New York, has been in Chicago for the past few weeks conferring with H. S. Doyle, manager of the reinforcing department of the American Steel and Wire Company. Triangle mesh will be pushed harder than ever now.

We met John D. Owens, the lime man of Owen, Ohio, over in Toledo the other day while he was calling on the trade. Mr. Owens came over from Pittsburg with Uncle Peter Martin, who took the opportunity of visiting the Gibsonburg plant of the Ohio and Western Lime Company.

Charles Weiler, of the Western Lime and Cement Company, Milwaukee, has returned from his protracted foreign tour looking as fine and fit as a thoroughbred ready to start odds on and hands down a Derby winner. He tells the most delightful account of the voyage, which was not along the beaten path ordinarily taken by American tourists. He picks out the Island of Madiera as the most beautiful place he saw. The mountains were manteled with purple and white flowers in January, and the streets and roads are all paved with round pebbles of such perfect smoothness that no wheeled vehicle is needed, and there are no horses, but little bulls are harnessed to sleds with wooden runners, and these glide noiselessly over the pavement. Mrs. Weiler also admired and enjoyed the short stay at Madeira more than any other part of the trip. The party found Milwaukee beer on the steamboats that ply the upper stretches of the Nile. "And home seemed nearer," said Mr. Weiler.

Charles L. Johnson, one of the best known cement salesmen in this country and for a long time connected with the Castalia Portland Cement Company, has associated himself with the Western States Portland Cement Company. He will be in the sales department with Mr. McClaren and will occupy Room 218 in the New York Life Building in Kansas City. Mr. Johnson is regarded as one of the best posted salesmen in the business. He was elected secretary of the Sales Managers' Branch of the American Portland Cement Manufacturers when that live and hustling organization was formed, and has a host of friends all over the country, who wish him success in his new venture.

L. V. Thayer, of Minneapolis, president of the Peerless Brick Machine Company, was a recent Chicago visitor. He just came down to close a few orders with customers by appointment. He says business has been steadily improving since the close of the cement shows.

George Keyes, the Louisville representative of the Ætna Powder Company, says there's something doing every day in his district.

A. A. Pauly, Youngstown, O., the inventor of the line of machinery that makes concrete structural tile, has been in New York the greater part of the month getting a big tile manufacturing plant in operation to begin supplying the metropolis and surrounding territory with the new commodity. He reports the machinery all working in good order and the Concrete Products Company of New York making a very high grade line of tile. Ross F. Tucker, one of the most prominent engineers of the country, is president of the New York company, and associated with him are several other gentlemen equally eminent in the structural world. The entire output of the plant for the present year is practically placed.

The National Cement Users' Association has just adopted by referendum vote of the members, "Standard Building Regulations for the use of Reinforced Concrete," a copy of which has been supplied to each and every member of the association. This document is a valuable acquisition to concrete literature owing to the fact that it has been produced by careful concentration of able committees and developed by open discussion at the recent Cleveland convention.

There are one or two minor points in the specifications that are open to criticism as possibly discriminating against expanded metal and wire fabric systems of reinforcement that have been well tried out, which is doubtless due to oversight and can easily find adjustment. With this it stands as the best practical and most comprehensive guide to the intelligent use of reinforced concrete that has yet been developed. To the indefatigable president of the association, Richard L. Humphrey, and the members of the reinforced concrete committee, too much credit cannot be given for this long needed fundamental document.

Charles C. Kritzer, of the Kritzer Company, Chicago, has sold another large lime hydrating mill to the Austin White Lime Company, of Austin, Tex., the machinery outfit for which is now under construction. This company is one of the oldest and most extensive lime producing concerns of the southwest, producing a high calcium lime of very fine quality. Mr. Kritzer has just completed the second hydrating mill to be installed by the Kelley Island Lime and Transport Company, which goes into commission in the next few weeks. From every part of the country the reports come that the hydrating mills are busy, running to capacity and consequently gaining in popularity because they are profit producers.

Dr. F. G. Ladd, a capitalist of Crook, Col., was a recent Chicago visitor, looking over the concrete machinery market. He is organizing a company and will enter the business of manufacturing concrete building materials upon an extensive scale at the thriving little town of Crook. He says that they have acquired a large deposit of sand which seems to be well adapted for the manufacture of a full line of concrete materials. Dr. Ladd and his associates, who are connected with him in the concrete factory proposition, are also heavily interested in the irrigation problem of the east central portion of Colorado, which is now near-

CHARLES L. JOHNSON, KANSAS CITY, MO.

ing completion. The Platte River has been and is being harnessed for irrigation purposes by the state acting in conjunction with private corporate interests and the reclamation by irrigation of very large and valuable tracts of farming lands is just about achieved. The main trunk lines of the artificial water supply is provided by the work of the state, while the latterals branching out from the mains are improved by private interests.

The Premier Fire Clay Products Company, Oskaloosa, Mo., have their 40,000-a-day capacity fire brick plant in operation, with general offices in the Finance Building, Kansas City. The officers of this company are D. H. Binns, president, and A. R. Dillon, secretary. They are both well known to the building material trade, Mr. Binns having for many years operated in stucco retarder at Uhrichsville and Port Clinton, Ohio, and Mr. Dillon has been connected with the fire clay lines for many years past.

It is said this company has the finest fire clay in the United States, and they are particularly well equipped to manufacture face brick as well and will be a big factor in the southwest.

Kenneth Hartley, C. E., Kansas City, Mo., requests ROCK PRODUCTS to make a correction of a statement contained in our columns last month in which he was mentioned as the city engineer. It develops that this is not the case, J. L. Darnell is at the present time occupying that position. The erroneous information was given to one of our reporters through error.

Among the visiting members of the sand lime brick fraternity this past month were Matthew Noal and T. R. Cutler, Jr., of Salt Lake City. They have been operating a sand lime brick plant of the American type, and the Intermountain Cement and Brick Company, of Idaho Falls, Ida., has been very successful since Carmichael, of the American Clay Machinery Company, Willoughby, O., installed same some months ago.

While east Messrs. Cutler and Noal purchased the second plant of this company, which will be operated at Salt Lake City, Utah. Mr. Noal is a member of the firm of Asper-Noal Company, contractors and dealers in building materials at Salt Lake, and is very much interested in a number of new lines of construction, he having investigated many new features in the building material line, although Salt Lake City is not behind the times, having had a very successful year during 1908 and things look favorable for 1909.

At Youngstown, O., the home of Pauly the inventor of concrete structural tile, there is only one noticeable feature, and that is the fact that every new building is a concrete one (and there are a lot of them, ranging in cost from a million dollars downward), and all of them using concrete tile in one way or another. The goods were introduced commercially about eighteen months ago, and now has the first call with every builder and every designer of a building. It is recognized as the long-expected improvement in the shape of a handy concrete building material for universal use.

NEW YORK BUILDING CODE.

Two Opposing Reports From Revision Commission to Be Publicly Reviewed by The Board of Aldermen.

Nearly a year ago the Board of Aldermen of New York took up the matter of revising the building code, with the result that a commission was appointed last fall to make such revisions as would provide for new and improved types of construction and materials, and in every other way bring the building ordinance of the metropolis up to date. It has labored like every other political commission labors, and has brought forth in the shape of the majority report just about the kind of a creature that might be expected to issue from such parentage. On May 6 this majority report was adopted by the committee on buildings of the Board of Aldermen without being read in a meeting that lasted less than a quarter of an hour. A minority report was offered but refused a reading.

The majority report is one of those political iniquities that fails of its own rottenness. The minority report, although refused a reading by the committee on buildings, was promptly given publication in the *Tribune*, the *Journal* and nearly all the leading newspapers, and then the public began to take a hand, as the minority report naturally exposes the faults of the report adopted by the committee on buildings, not yet made public.

A storm of protest from those best qualified to stand out for the public interests has resulted in President McGowan ordering both the majority and minority reports from the commission being printed, so that both can be considered by the Board of Aldermen before final action is taken. Persons opposed to any of the provisions of the new building code will have an opportunity to be heard. All types of building materials and systems of construction will be represented.

The New York Chapter of the American Institute of Architects, through its executive committee, sent a protest signed by Arnold W. Brunner, the president, and D. Everett Waid, the secretary. The New York chapter said:

> The importance of this building code to the public and the building interests of the city of New York is so vital that we respectfully petition your honorable body to postpone final action on the code until an opportunity be given the public to examine and discuss it in its present form.

Alderman R. S. Doull, a member of the commission who signed the minority report, said the code favored by the majority was a worse code than that which it was sought to have improved. Alderman Doull said:

> The new code would prove more expensive to the builders, and the buildings erected under its provisions would not be as safe as under the old. The changes tentatively made allow increased weight on all floors without requiring heavier walls. It was totally unnecessary to allow more weight. The new code is in defiance of all laws and from the point of view of the up to date builder is full of absurdities.

Blow Aimed at Concrete.

The concrete men in general saw in the new code a deathblow to the growth of their business. The

restrictions in fireproofing, the elimination of cinder concrete in the short arch construction and the limiting of the height of reinforced concrete buildings were the features of the majority report that caused opposition. But the minority report also limited the height of reinforced concrete buildings, and this was also said to be without reason. The majority report limited the height to seventy-five feet and the minority to eighty-five feet. That would mean that no building could be erected of that material higher than seven stories and would shut it out of the big city. H. L. Turner, of the Turner Construction Company, said:

It cannot be said that a building of reinforced concrete higher than seven stories is not safe. We have them now ten stories high, and they are absolutely free from danger. Manufacturers will not want buildings of our material on costly ground if the limit as to height is imposed. We have met every fire and engineering test, and there is no ground excepting competition upon which objection to higher buildings can be made. There is no limit in other cities. There is none here now. There is a natural limit imposed by the engineering design, and that is all. But we are powerful competitors of the steel and other material interests.

There will be an increase in the price of hollow tile if the new building code is accepted. The elimination of cinder concrete for arches would mean the substitution of hollow tile. It is cheaper than stone concrete now, but more expensive than the cinder concrete. If the latter is shut out, the competition will be between the stone concrete and the hollow tile, and as the former is much more expensive the hollow tile people would have it all their own way and could raise the price to suit themselves. Of course, the public would be the principal sufferer. They cannot shut us out altogether, but can cripple us, and hence the competitive interests have obtained a limitation of the height of buildings built of reinforced concrete.

Says Public Will Pay.

Other heads of construction companies that use concrete as a building material, especially the Roebling Company, spoke in a similar vein. The latter would suffer greatly if the new code were adopted, as it employs cinder-concrete to a large extent in arch construction.

But Ross F. Tucker, the president of the Concrete Products Company, said that the new code should be judged by its influence upon the building public. He asserted that the crippling of concrete construction would eliminate competition and the public would have to pay the price. He said:

If this new code is made law it means millions to the terra cotta interests at the expense of the building public. The bureau of buildings has been very watchful and rigorous in respect to the concrete systems in use in this city, and every one of them has been submitted to an extraordinary fire, water and load test before being authorized for use.

Regarding the cinder-concrete, Mr. Tucker said that it was the best fire resisting material in use for building construction and is different and far better than the ashes concrete used on top of other materials in arches for filling. The latter, he said, had been found to be a poor fire resister, but if the cinder-concrete were to be eliminated the poorer material would be put in common use.

THE CODE SYSTEM OF INSPECTION IN NEW YORK, ACCORDING TO THE JOURNAL ARTIST.

The T-Square Club As Hosts.

PHILADELPHIA, PA., April 30.—The T-Square Club, of Philadelphia, with the coöperation of the Philadelphia Chapter, American Institute of Architects, tendered a reception to the members of the Master Builders' Exchange, at the Pennsylvania Academy of the Fine Arts, on the evening of April 23. The object of this entertainment was to bring into closer communication the architects and builders, that it might be impressed upon the mind of each, the advantage of working more generally together, of a need of a stronger coalition between the artists who design and the artists who execute; with this end in view a number of these meetings will be held during the year to the interest of all concerned. There was a very fair representation of these three associations, who in the early evening scattered themselves in the various rooms of the academy feasting their eyes upon the beautiful paintings and the various works of art of which there is always a fine collection.

Later in the evening Milton B. Medary, Jr., president of the T-square Club, after extending a warm welcome to the guests introduced D. Knickerbocker Boyd, president of the Philadelphia Chapter, American Institute of Architects, and very popular personally among the members of the Master Builders' Exchange, who introduced William L. Price, architect, of Philadelphia, who explained very graphically to the boys the true meaning of art, what it is, and what it is not, and what constitutes the purest and most satisfactory architecture; he led them back to the days when art was cultivated and developed for art's sake and not for the sordid remuneration it might bring; to the days, the true artistic spirit of which Emerson beautifully expresses in the lines:

Himself from God he could not free,
He builded better than he knew,
The conscious stones to beauty grew.

He endeavored to impress strongly upon his hearers that the work that creates and not the work that reproduces the ideas of others is the real art. He would advise architects who go abroad to view the work of the old masters, thinking in this way to obtain ideas upon the subject, to study the lives of these masters, their controlling motives and incentives, and when they have learned that those who have succeeded best are those who threw their whole soul into their art regardless of other considerations, let them take lessons as the best aid in the pursuance of the life work they have chosen.

Mr. Price dwelt long upon the benefit to be derived from frequent consultation between the architect and craftsman, and trusted the time was near when a more thorough understanding and coöperation would exist between these allied lines. At 10 p. m. the guests were invited to partake of an elaborate collation. and the residue of the evening was spent in pleasant social intercourse. Altogether it was voted a highly interesting and enjoyable affair.

Among those present were the following:

Lesley & Trinkle Company, Gaston Daus, manager.
John F. Wilt.
E. Webster.
John O'Donnell.
Wm. Conway.
James Connor.
Jas. C. Taylor.
John W. Cornell.
Daniel Adams.
Franklin M. Harris, Jr., president.
J. Lindsay Little.
John R. Wiggins.
Albert McChesney and Geo. W. Biddle, of McChesney & Biddle.
Berry Bros.
C. Stanley French.
J. T. Plummer.
R. W. Hilles.
Wm. F. Lilly.
Jos. E. Brown.
Rush J. Whiteside & Sons.
J. T. Allen.
Samuel Crothers.
H. C. Morse, John Lucas & Company.
Peoples Bros.
H. W. Geshwind.
John C. Humphreys & Son.
F. L. Hoover & Sons.
Hires, Turner Glass Company.
Chas. S. Prizer.
H. J. Fuller.
I. W. Kenderdine.
J. D. Brainard.
Patrick S. Smith.
Stacy Reeves & Sons.
B. K. Nusbaum.
Mathew Schmid.
W. S. P. Shields.
Linton & Fowler.
Makin & Dunn.
Boon & Sample.
G. W. Field, of Chas. J. Fields' Sons.
H. B. Green.
Thos. F. Armstrong.
Wm. Gray & Sons.
Frank H. Reeves.
Warren L. Edgar.
Gara, McGinley & Company.
H. S. Andrews
Harry T. Saunders.
W. T. Reynolds.
Chas. Rupp.
John C. Atkinson.
A. Raymond Raff.
John G. Fleck of Fleck Bros. & Co.
Webster & Keyser.
Richard Torpin & Co.
W. I. Kimball.
Herman Voigt.
John H. Holmes.
R. H. Watson.
J. Morris Daniels.
James J. Ryan.
Geo. W. Roydhouse.
Wm. A. Kramer.
Cyrus Borgner.
Wm. P. Ogelsby.
James Johnston.
A. S. Slack.
D. O. Boorse.
F. A. Black & Son, Inc.
John J. Byrne.
O. W. Ketcham.
C. E. Smith, Secretary.
Chas. H. Ehrenzeller.

A World's Exposition at Boston.

The Boston *Herald* has started to agitate a grand world's exposition to be held in Boston during the year 1920, to celebrate the three hundredth anniversary of the landing of the Pilgrim Fathers and the establishing of the Massachusetts Bay Colony. These International expositions are invariably the occasion for the development of architecture and have probably done more to advance the higher attainment of the promotion and education of the public than any other invention of the nineteenth century.

Commencing with Crystal Palace, held in London in 1850, under the personal patronage of the Prince Consort, through the whole list down to the Jamestown Exposition, held only a year ago, there has been a feast of good things for the architect and an uplift of the building public.

An exposition of this kind held within the classic atmosphere of old Boston, if there can be anything classic this side of the Atlantic, can be nothing less than an epoch maker. Every member of the architectural profession and every man interested in the progress of higher building ideals should give the Pilgrim Tercentenary Exposition a hearty boost.

Optimism the Keynote.

A Chicago Sunday paper printed a number of optimistic interviews with captains of industry, magnates and bankers, which shows the trend of affairs as they are today. The consensus of opinion is that good times are imminent, but not yet, almost, but not quite. We heartily concur in the opinions expressed and believe in spreading the gospel of good times. Here are a few of the opinions:

Sunlight, Says Gary.

Elbert H. Gary, head of the United States Steel Comporation: "We will soon be on the high road to prosperity. The mists are clearing away and we shall soon see the sun of prosperity bright as it ever has been. I have said all along that this country could not long remain inactive and given up to sad reflection, but that a new day would find us up and doing. The day is due. The clouds that have been hanging over business for the last eighteen months are broken and we have sunlight again."

Good Demand for Steel.

William E. Corey, president of the United States Steel Corporation: "Since early March there has been a gradual and well-sustained improvement in the steel industry. The subsidiary companies in the United States Steel Corporation are now operating on a basis of about 75 per cent of their normal capacity, which is the highest since 1907. There is every indication that this improvement is due to a natural and healthy demand for our products, and with average crops and an early settlement of the tariff we confidently expect a speedy return to normal conditions. The tendency of prices is distinctly upward, but the movement in this direction will probably be and should be a gradual one."

Building Trades Busy.

Paul Starrett, president of the George A. Fuller Company, builders: "There is more new construction work now than there has ever been before in New York. My company never had so much work under way as it has now. We are ahead of the record of two years ago—in fact ahead of any at the same time of the year. The period of cessation of activity in the building trades was shorter than in some other lines. We felt the let-down considerably last year, but so far this year construction work has been as great as in the best of years. If you look around you will see that there is a great amount of building going on in this city, large operations, too. More of them are planned and there seems to be a natural freedom in contracts for future work. This is a business that is not agreed upon today and work begun tomorrow, you know, because it takes time to get materials together, and when people are willing to commit themselves to plans far ahead it means that the way looks clear to them. I look for a busy fall."

Hill is Optimistic.

James J. Hill, chairman of the Great Northern Railroad: "The outlook is good in all directions. The Great Northern Road runs through a district that supplies one-sixth of the wheat of the United States. The wheat outlook is good. I do not think there will be a big crop, but it promises to be a fair one. Heavy snows that lasted late into the spring prevented plowing, and after the ground was ready many farmers put in oats and barley instead of wheat, so that the loss is in wheat acreage rather than in failure of crop, and for this there are compensations. The West and South are to be the great sections of this country in the future. The West is now, for that matter. The South exhausted her soil before the war by her improvident method of agriculture and is now struggling toward a restoration of it. When the tariff agitation is over in Washington things will begin to hum."

AMERICA'S SHAME.

Per Capita of Fire Losses Greater than All Other Taxation—Easy to Avoid by the Use of Concrete.

Collectively speaking, Americans are most prodigal of their wealth. We have not received and digested the lessons of past conflagrations, and the percentage of fire losses increases with each succeeding year. The number of highly inflammable structures increases with alarming regularity in spite of the progress of applied science, which has demonstrated that it is no longer necessary or even economical to build with wood to the practical exclusion of non-burning materials that are offered in vain in unlimited quantities. In the city of Chicago, for instance, where there has been a lesson sufficiently vivid to impress itself for all time, all the buildings (with a few shining exceptions of course) are of the flimsiest character. Brick and other clay goods so poorly burned that they have no structural value whatever are accepted on all classes of work, often to the exclusion of much better goods offered at parallel prices having high inherent structural values. But this is trivial compared to the enormous use of fuel materials. Not one per cent of the buildings in Chicago, counting all of them, has any precaution against fire whatever, unless the city fire department is taken as an adequate defense. When one considers that fully 75 per cent of the people of Chicago live in houses located at least one mile and a half from the nearest fire station, and every house liable to burn to the ground in five to ten minutes, the true status of affairs becomes apparent. Here is no reflection upon the fire department, because it is probably the most efficient organization of the kind in the world, but at best it can only economize time, and must always overcome distance. An example in point occurred on May 20, in broad daylight, when people were awake and on their guard. The Toledo Flats were totally destroyed in about one hour's time. The fire started in the basement by an insignificant explosion of gas caused by a workman repairing the pipes. The floor above was dry as tinder and took fire at the first puff. By the record in just three minutes thereafter the flames broke through the roof of the four-story building. Two human lives were wiped out without warning, and half a hundred people injured, some of them seriously and permanently incapacitated for life. The property loss to the building amounts to $75,000, and the personal effects of the occupants will come to fully that much again. Thirty families, amounting to 170 persons, were rendered homeless, with very considerable losses in every case. It is indeed merciful that the disaster came at 10 a. m., when more than half of the occupants were out of the building. Had it come in the middle of the night it is certain that more than half of them would have lost their lives. There are no less than 20,000 similar fire traps in Chicago now, another thousand of the same type are under construction at the present moment, in fact the type is so popular that no other kind of building is given serious consideration. Is this not criminal carelessness or negligence? Is it not a terrible state of affairs to exist in the enlightened twentieth century?

Now all you gentle readers who live in other cities be not deceived nor put on the attitude of the thankful Pharasee, for you are no better off, the identical conditions obtain in Baltimore, with a recent lesson unlearned, in Boston, New York, Philadelphia, St. Louis—in short every other city, town and hamlet of the country.

The Portland cement industry with its long list of experts, and well approved practical developments, has obliterated the last scintilla of excuse for such building now and in the future. At least incipient conflagrations are made impossible by the intelligent use of concrete, and it has been demonstrated over and over again that well constructed concrete buildings can be depended upon to stay the progress of great fires. It is impossible for a concrete building to burn or feed a fire, while brick outer walls filled with wooden interior construction is no better than an all frame building as a fire resister. The present cost of concrete and concrete work is less today than it ever has been, and it is quite possible to avoid the fire danger to human life and the fire risk to property by making use of it in all classes of buildings, especially the homes. ROCK PRODUCTS will gladly give every inquirer direct information upon this important subject; we are doing it every day for large numbers of people who are making practical use of it.

In this connection the recent report of J. Montgomery Hare, of New York, president of the National Board of Fire Underwriters, is in point. He states that the per capita loss by fire in this country is from twenty to thirty times greater than in European countries:

For the last five years the average annual loss by fire in this country has been over a quarter of a billion, the total for the period having been $1,346,002,059, which is a daily destruction of nearly $750,000.

The heavy average was largely augmented by the San Francisco and Baltimore fires, but taking the last two years by themselves, President Hare showed there was a loss of $215,084,709 in 1907 and of $217,885,850 in 1908, indicating, he said, that the annual destruction is likely to continue above the $200,000,000 mark. He pointed out that for the first three months of 1909 it has amounted to nearly $53,000,000 giving no promise of improvement.

Large Losses Not Included.

These figures do not include the loss from the burning of forests, personal property, nor do they take into account the indirect cost of fires, such as the expense to the public of maintaining fire departments and waterworks.

It often has been remarked that the appliances for the extinguishing of fires in Europe fall far below the standard prevailing in the United States and the same probably is true of the water facilities for extinguishing fires, at least outside of the large cities and yet, with all our superiority in these respects, we lead the world in the destruction of property by fire.

The questions of construction explain a part of the difference and climatic conditions may play their part, but when everything is considered I believe that the conclusion will follow that the main reason is recklessness here as against the care, forethought, and wise supervision in Europe.

In support of the belief that it is the carelessness of the American public that is most to blame for the conditions here, he pointed out that in a list of 522,716 fires in the United States during the last five years, at least one-half could be properly ascribed to carelessness in one form or another.

Underwriters' Recommendations.

One of the most promising of the movements to restrict the destruction by fire is seen in the work of the national conservation commission. The underwriters have made the following recommendations to the commission as the best means of cutting down fire losses:

First, that the public should be brought to understand that property destroyed by fire is gone forever and is not replaced by the distribution of insurance, which is a tax collected for the purpose.

Second, that the states severally adopt and enforce a building code which shall require a high type of safe construction.

Third, that the states establish and maintain an official or officials who shall be required to investigate the cause and origin of all fires.

Fourth, that municipalities adopt ordinances governing the use and keeping of explosives, especially inflammable commodities and other special hazards, such as electric wiring, the storing of refuse, waste, or packing material.

Our Annual Sacrifice of Human Life.

That the casualty risk in American industries is a most serious one, toward the reduction of which every effort should be made, is a fact that stares the American employer in the face. Granting that the underlying conditions in America are often quite different from those abroad, and that many of our industrial accidents are the result of ignorance, reckless indifference or carelessness, the fact remains that the European industrial methods are far in advance over those of America, and the fact also remains that an imemnse amount of human life is sacrificed to the making of the almighty dollar.

It has been shown that approximately one life is sacrificed to every story of the modern skyscraper; that there are 50,000 avoidable deaths annually. There are thousands upon thousands of widows and orphans made every year by industrial accidents, and thousands of widows of these workingmen are today doing men's work, having been left penniless by their unfortunate husbands.

That there are remedies for the saving of 50,000 American lives annually the modern American employer has realized. Some employers have voluntarily adopted safety systems to protect their employees, and the systems have been found to work well.

But, the great majority of employees, however, have done practically nothing for their employees, and, moreover, they even fight to the last ditch to prevent paying an employee for injuries received while at work, even bitterly fight the widows who try to get some recompense for the loss of a killed husband.

When will the human heart, which every man possesses, whether he will or no, of the thousands of employers assert itself and demand that he be more careful in the guarding of the human lives under his control?

Anticipate Larger Business.

TOLEDO, OHIO, May 19.—Crawford and Tarbell, crushed rock operators and general road contractors, have this to say regarding their business: "We have just completed extensive repairs on our plant, at Genoa, Ohio, and are looking for a large year's business as we have three large contracts and several smaller ones. We have installed a number 15 Western crusher, which more than doubles our capacity, and have tried it long enough to know it is a success."

FOR THE RETAILER

The National Builders' Supply Association

Meets Annually.

OFFICERS.

Frank S. Wright, Chicago.....President
Harry W. Classen, Baltimore.....Treasurer
James W. Wardrop, Pittsburg.....Secretary

STATE VICE-PRESIDENTS.

Arkansas.....Charles E. Taylor, Little Rock
California.....C. J. Waterhouse, San Francisco
Delaware.....Charles Bye, Wilmington
District of Columbia.....S. D. Lincoln, Washington
Indiana.....H. B. Lyman, Lafayette
Illinois.....H. H. Halliday, Cairo
Iowa.....R. Hay, Dubuque
Kentucky.....Owen Tyler, Louisville
Louisiana.....John J. Voekel, New Orleans
Maryland.....J. J. Keily, Baltimore
Massachusetts.....B. F. Marsh, Worcester
Michigan.....S. J. Vail, Detroit
Missouri.....Howard McCutcheon, Kansas City
Minnesota.....F. J. Nixon, Duluth
New Jersey.....Ambrose Tomkins, Newark
New York.....M. A. Reeb, Buffalo
Ohio.....E. S. Walton, Youngstown
Pennsylvania.....Cyrus Borginer, Philadelphia
Rhode Island.....C. M. Kelly, Providence
South Carolina.....A. G. Gower, Greenville
Tennessee.....W. W. Fischer, Memphis
West Virginia.....R. W. Marshall, Wheeling
Wisconsin.....R. C. Brown, Oshkosh
Washington,.....S. W. R. Dailey, Seattle
Georgia.....P. G. Hanahan, Atlanta

EXECUTIVE COMMITTEE.

James G. Lincoln, Boston; Walter F. Jahnke, New Orleans; A. E. Bradshaw, Indianapolis; Gordon Willis, St. Louis; V. H. Kriegshaber, Atlanta.

Official Organ, ROCK PRODUCTS

General Improvement Noted.

It is wonderful what an effect a few bright days of sunshine will have on business in the spring. As soon as grass begins to get green and the leaves begin to come out on the trees, everyone seems to become imbued with the idea of building. There is something in the atmosphere which makes a man want to get up and do something.

From all over the country come encouraging reports of the resumption of building on a large scale. The people are getting tired waiting for the tariff reformers and are going ahead anyhow. For after all even after the new tariff bill is passed it will be some time before its effect is felt whether good or bad, and until that time people might as well get busy. If everyone just sat down and waited nothing would ever be done. Building materials of all kinds are lower now than they ever will be again and it is a wise man that places his order now. The labor crisis is passed, as new agreements have been made ratifying the old scale in most cases and for another twelve months there is nothing to fear in that direction.

Steel may go down lower, but as that is only a possibility, why worry over that? It is as low now as it has been for sometime past and as long as there is no immediate prospect of a change this should not deter men who use this character of material.

As an indication of the general revival it might be mentioned that late reports from New York say that there are sixty million dollars' worth of work on hand now, with the prospects good that it will keep up. Before the year is up in New York, at the present rate, the amount should run over the two hundred million mark, which would be a new record for that city. As New York is the thermometer of the whole country it is only reasonable to suppose that this great wave of building prosperity will extend all over the United States. The banks have plenty of money and the people have the same energy they had previous to the panic, so there is no reason why conditions should not soon assume normal proportions.

The Yardville Sand Company has been incorporated at Camden, N. Y., to manufacture concrete brick. Capital stock, $125,000. Incorporators: F. R. Hansell, George H. B. Martin and John A. MacPeak.

The Concrete and Clay Products Company has been incorporated at Wilmington, Del., with a capital stock of $500,000. Incorporators are C. H. Bellamy, W. Flint Jr., H. F. Smith, Philadelphia, Pa.

The Sterling Furniture Company, of Salamanca, N. Y., will build a four-story factory, 130'x60', with curtain walls of brick.

Power Trucks—Information and Experience of The Charles Warner Company.

By Charles Warner.

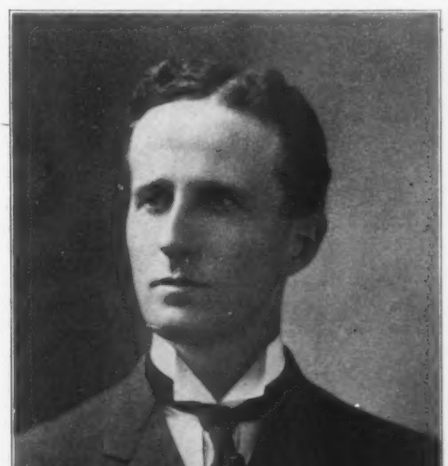
About a year ago we concluded to actively investigate the problem of using automobile trucks for the delivery of building materials. Our investigations took into account the three general sources of power used, namely, electricity, steam and gasoline.

The electrically driven trucks, while quite generally used in large cities, where heavy grades are infrequent and where solid paving can be counted upon for their continued use, could hardly be considered as a satisfactory source of power for the delivery of building materials. The conditions of reaching the average building operation, pulling through heavy streets and into the operation called for a truck of the lightest possible weight with a maximum of power. The heavy batteries and the lighter power of the average electric truck was therefore considered entirely unsuited to such service.

Steam trucks might be considered of value for such service, but automobile manufacturers have not developed steam power to a satisfactory point, considered commercially.

The gasoline trucks on the market offered the most desirable features in the way of lightness of weight and large power, and many of such trucks have been commercially developed during the past three or four years, so as to provide standard apparatus to a large extent.

We therefore settled upon the gasoline truck as a type, and our investigations along this line developed two general classes being commercially manufactured.



CHARLES WARNER, FIRST VICE-PRESIDENT, THE CHARLES WARNER COMPANY, WILMINGTON, DEL.

The first class is of a simpler form and more of a fool-proof type. It generally has a simple two-cylinder gasoline engine with double chain drive to the rear wheels, and employs the planetary transmission with, as a rule, two speeds forward and one reverse. This transmission does not require the use of a master clutch and the shifting of gears, but the different speeds are secured by the simple pressure of foot pedals or individual levers. This class usually omits the spark advance lever, with the idea of relieving the driver of every possible complication. While this omission makes towards simplicity of operation, it is offset, more or less, through sacrifice in the power and economy of the engine.

The second class of gasoline trucks usually follows standard touring car practice as employed in the heaviest and most expensive automobiles. The four-cylinder engine is located in the front, and the drive is effected through friction clutch, slide gear transmission and double chain drive to the rear wheels. The gear box generally contains three or four changes of speed forward and one reverse.

Whether it is desirable to follow the first or second class depends to some extent on local conditions and the viewpoint of the purchaser. We considered that it was necessary to have a good man in charge of each truck, and that it was more practical to use a machine of the second class.

While this latter class is slightly more complicated and requires a better man for its operation it has the advantage of being handled more easily in crowded city streets, of negotiating hilly country at a higher rate of speed, and of being more economical in the consumption of gasoline.

No one should purchase a motor truck without a full realization of the limitations of trucks in common with any machinery. In freeing ourselves of the shortcomings of the horse new troubles and problems are naturally brought up in the use of motor trucks. A horse has the limitations in its strength, and all the harness and wagon parts are made strong enough to withstand the strength of the horse, based upon long experience. On the same general principle a motor truck must have its weakest part. In other words, under conditions of severe strain some point in its mechanism must be in position to give or stop before material damage is done.

What this part must be is still an open question. Users will always be dissatisfied with an insufficiently powerful engine. Even this does not cover the point entirely, as a careless driver could, by dropping his clutch in too quickly, break some of the machinery if the truck was starting up a steep grade, or had its wheels partly sunk in a mud hole.

It might be expected that the slipping of the tires could be depended upon as the point of least resistance. This is not entirely satisfactory, as our experience has shown. When we purchased our first truck we had it equipped with the standard dual tires, which would slip in cases of hard going, so that no excessive strain could be thrown upon the machinery. In order to prevent this slipping in muddy ground, or when the streets were covered with snow, we provided tire chains similar to those used on touring cars. These were unsuitable, as they quickly sheared off in crossing car tracks. Since there would be too much delay in attaching these tire chains only where the ground was bad, and removing them during the ordinary running, we refitted the rear wheels with rubber block tires. These gave exceedingly satisfactory results throughout bad weather and slippery conditions; but these block tires, while they practically cured the troubles due to slipping and skidding, threw the point of least resistance on to the machinery.

The sprocket chains leading from the counter-shaft to the real wheels began to break occasionally when the truck had to pull out of a heavy place. In view of this we specified for our next truck heavier sprockets and chains; but just about that time, in an exceedingly difficult position, the truck twisted off one end of its counter-shaft. We came to the conclusion, therefore, that the original chains were sufficiently heavy, and that it was much better to have them break frequently at small cost and little loss of time than to run the risk of more serious breakages. Accordingly we countermanded the order for heavier chains, and will use the same strength in our new truck.

We have now had one three-ton gasoline truck in regular operation for the past seven or eight months, during which time we have had the experiences enumerated above. These experiences have permitted us to arrive at the best working conditions to meet the requirements of the builders' supply yard.

As now operating this truck goes practically every place that a horse can go, and many places that a horse cannot reach. It carries practically the same loads under bad weather conditions and with snow of several inches depth as under the best conditions; whereas, the bad weather conditions usually require only about half loads on horses, while the truck we have in use is a three-ton truck as normally rated, it is frequently loaded up to four tons by our men, and our general instructions at the time of placing it in service in the fall of 1908 were to "put it through a course of sprouts," and not to spare it in any way so far as the general service was concerned.

The operator employed was a young man of a few years' experience in machine shop practice, and of some experience in operating automobiles. The truck was placed in his charge with the arrangement that he was to assist in loading and unloading, the same as a driver would do. He was paid at a maximum of $2.50 a day, which required fifty-five hours as a minimum of actual service on the streets per week. A drawback from his wages is made at a certain rate providing the weekly hours' service falls below fifty-five hours. In other words, it is to the interest of the operator to keep the machine moving in the best possible shape during working hours, and to do minor overhauling, oiling and charging outside of these working hours.

As a commercial problem it is interesting to note that certain factors which enter only lightly in the common team service become very heavy in using a motor truck. These factors are the loading of the truck at the yard, and the unloading of materials at the job. The time lost at these points becomes a vary much larger percentage of the total time, because of the very quick movement of the truck between yard and job.

We have kept accurate detailed records of the time employed on every delivery and actual costs in connection therewith, and are satisfied that a dumping body operated by power from the engine should be used on these trucks wherever the materials handled

can be so discharged. We are also convinced that where possible materials should be loaded from bins into the trucks, which would very much increase the saving secured by us up to this date.

In making a comparison between horse teams and power truck service we have divided the work under two general headings. One of these headings is that service covered by deliveries to jobs at two miles or greater from the yard. At this class of service the truck will do the work of three two-horse teams. On the hauls of less than two miles from the yard, due to the time factor in loading and unloading, the truck will do the work of about two or two and a half teams.

The truck we are using cost complete $3,000. Three two-horse teams, including harness and wagons, cost about $2,500. Comparing all operating and depreciation costs of teams with the operating costs of the truck, and allowing twenty-five per cent depreciation per annum plus repairs on a truck, we find a saving of some eleven to twelve hundred dollars per annum in the use of each truck on the hauls exceeding two miles from the yard. On the shorter hauls, where the time saving is not quite so great, for the reasons mentioned, the saving ranges from about five to six hundred dollars.

Based upon this data and experience of the past seven or eight months our company has felt justified in ordering a second truck, as we feel confident that under proper supervision and in the hands of a reasonably good operator the commercial advantages for the delivery of builders' supplies has been demonstrated.

It must be born in mind, however, that the use and handling of such trucks cannot be delegated to the average man in your yards or to your drivers of teams. A new organization must be developed on broader lines, without practicing false economy, if motor trucks are to be satisfactorily used year in and year out in such service.

We do not feel that we have entirely worked out all of the detailed troubles that motor trucks may be heir to, as for many years to come improvements in design and construction will no doubt be steadily developed, making towards a more perfect machine; but on our part we are satisfied that it has reached a commercial stage for the enterprising and intelligent dealer or teamster. In other words, it will save money.

The Hammerschmidt & Franzen Company has been incorporated at Elmhurst, Ill., to deal in fuel, lumber and building material. Capital stock, $50,000. Incorporators: F. M. W. Hammerschmidt, G. H. Franzen and E. J. Bunge, of Elmhurst.

The Corey & Town Company has been incorporated at Syracuse, N. Y., to deal in roofing materials, lumber, cement blocks and the like. The capital stock is $5,000 and the incorporators and directors are Charles F. Corey, James R. Town and Josie S. Corey.

The Sater Crushed Stone Company of Stillwater, Okla., has been incorporated with a capital of $11,000. The directors are J. E. Sater, John I. Hastings, J. F. Lawrence, J. E. Sater, Jr., and E. W. Parker, all of Stillwater.

Obituary.

Frank P. Young, of 1600 Center Avenue, died at his home in Bay City, Mich., May 9, after an illness of eight weeks.

Mr. Young was one of the best known young business men in the city. He was a son of Mr. and Mrs. George H. Young, and was born in Albany, N. Y., in 1868, coming to Bay City with his parents two years later. After completing his education in the public schools and fitting himself for a business career he succeeded his father in the coal, wood and builders' supply trade, the firm being known as F. P. Young & Co. In the meantime he became interested in the coal mining industry, being one of the organizers of the Michigan Coal Mining Company, of which he was secretary and manager at the time of his death.

In 1893 the deceased was married to Miss Sarah Davidson, daughter of Capt. James Davidson. Besides the widow, four children survive him. He was a member of Bay City Lodge, No. 129, F. & A. M.; Blanchard Chapter, No. 58, R. A. M.; and Bay City Commandery, No. 29, Knights Templar.

After an illness of a year William B. Horrocks, thirty-six years old, a well-known coal, lime and cement dealer, whose yards are at Arnott Street Station on the Reading Railway, died recently at his home, Arnott and Horrocks Streets, Philadelphia, Pa. He was a native Philadelphian and a graduate of Brown Preparatory School. Fifteen years ago he entered business with his father and five years later established a business of his own. He was a prominent member of the First Vegetarian Congregation of Philadelphia. In 1901 he married a daughter of Dr. R. Bruce Burns. She, with one child, survives him.

THE OLDEST CONCERN

The Charles Warner Company of Wilmington and Philadelphia as Old as The Nation, Still Leaders in Every Progressive Measure.

Perhaps the most venerable concern in the business of manufacturing and distributing builders' supplies is the well known house of Warner, whose executive offices are located at Wilmington, Del. The Charles Warner Company has been well known as one of the most progressive, vigilant and efficient business organizations of this country throughout the entire recollection of men now living. The company maintains permanent sales offices in the Land Title Building, Philadelphia, Pa., at 1 Madison Avenue, New York City, and 161 Devonshire Street, Boston, besides the principal office at Wilmington, which has recently been removed to a suite of rooms in the Du-Pont Building, the first modern sky scraper of the city.

The house of Warner began the manufacture of building materials and their distribution in 1779, about the time the Republic was born. This was five generations ago, and the concern is today controlled by the descendents of the founders. In 1830 Charles Warner, who gave his name to the concern as we know it today, came into the business, which was conducted as a firm until 1885, when the incorporation of the Charles Warner Company was effected. The company is extensively engaged as retailers of building materials in the two cities of Philadelphia and Wilmington, both of which are practically home towns to the operations of the Charles Warner Company, by reason of their freight line of steamers in the Delaware river, with commodious wharves at both ends.

The warehousing and retailing of building materials in these two cities originally constituted the entire business in connection with the Philadelphia and Wilmington freight line of boats, but its development carried the interests of the concern back into the wholesaling and manufacturing end.

As sand reclaimers the company now owns and operates a large sand dredge on the Delaware river which washes and screens sand for all the various uses before discharging it into the barges. A fleet of ten barges of 450 tons capacity each and tug boats in connection therewith are maintained to conduct the work of the sand department. The daily volume of business in sand amounts to about 1,000 tons.

At Philadelphia the wharf properties of the company provide ample accommodation for the builders' supply department there and a sufficient number of teams are maintained to make the retail deliveries as required. At Wilmington, several warehouses and yards are maintained, from which the distribution of builders' supplies is conducted. Here, in addition to the mason supplies, the retail coal business and ice manufacturing in connection with cold storage warehouses are also conducted upon a very extensive basis. A mixed mortar mill is a part of the retail supply business with a capacity of 18,000 tons per annum, an important factor of the Wilmington establishment.

In the eastern Pennsylvania magnesium lime district the company operates a number of plants, namely at Cedar Hollow, Whiteland, McCoy, and Keystone, covering in all about 500 acres of land and having twenty-seven modern lime kilns, together with rock crusher, lime grinding and hydrating plants. During the active season from this branch of the company's operation about thirty carloads daily of lime products are shipped out, embracing lump, ground and hydrated lime and crushed rock for furnace fluxing and concrete purposes. During the past few years all of these plants have been re-equipped with the most up-to-date machinery, such as power-driven apparatus for every mechanical purpose, car haulage and electrical transmission systems, etc. This has all been installed with the best technical advice and occupies front rank for efficiency and economy.

Besides the lime manufactured at the plants mentioned the outputs from several other companies are handled at wholesale which brings up the total of lime distribution to over a million barrels per annum. The shipments of sand, lime, cement, plaster and fuel amount in the average not less than 120 car loads per day during the busy season.

The company is the general sales agent for the product of the Nazareth Cement Company, which amounts to one million barrels per annum.

The wholesale organization covers the territory bounded by a line running from Richmond, Va., through Louisville, Ky., Chicago and St. Louis and east on the Canadian border line.

The officers of the Charles Warner Company at the present time are Alfred D. Warner, president; Charles Warner, first vice-president; John Warner, second vice-president and purchasing agent; A. D. Warner, Jr., treasurer; Irving Warner, general plant manager, and Charles C. Bye, secretary.

Mr. Bye has charge of the distributing agencies west of the Alleghenies as well as the trade alliances with the manufacturing companies that produce materials. He is also in charge of the sales of fuel and traffic matters. F. A. Daboll is the general sales manager in the builders' supply lines carried by the company, in the eastern district bounded by the Alleghenies on the west and from Virginia to Maine. The company employs at its various plants and offices no less than 1,000 men.

While this concern is the oldest now in operation, it is in all respects one of the livest organizations known to the trade. There is no progressive movement where the proper representative of this establishment is not to be found, in the same leading position that they have always occupied.

Big Supply Companies Merge.

CLEVELAND, O., May 18.—One of the biggest supply company mergers ever consummated has just been made in Cleveland, where there are located several of the largest building supply concerns in the world. The Kelley Island Lime and Transport Company has absorbed its two largest rivals, the Cleveland Builders' Supply Company and the Mason's Supply Company, making by far the strongest supply corporation in existence. The merger has taken place, its promoters say, to cut down the office expenses and to facilitate trade generally.

It is planned to continue the operation of the Cleveland Builders' Supply Company as the retail selling end of the Kelley Island Company, which will in future be a wholesale concern only. The Masons' Supply Company will in all probability cease to exist, its business being taken over intact. It is understood that the Cleveland Builders' Supply Company cost the Kelley company an even $1,000,000.

Some months ago John A. Kling, president and chief stockholder of the Cleveland Builders' Supply Company, was injured in an elevator in the Garfield building, where the company's offices are located. He was in a hospital for months and spent much time traveling in search of health. He gives this as his main reason for selling out at this time. Other officers of the purchased company are: C. O. Evarts, vice-president; Philip Straus, treasurer, and Charles F. Miller, secretary.

The Kelley Island Lime and Transport Company, which is the largest manufacturer of lime in the world, is capitalized for $5,000,000. Caleb E. Gowan is head of the company. Among the influential stockholders are: D. C. Cutter, of Duluth; Norman Kelley, W. A. Pardee, A. S. Chisholm, W. D. Rees, F. A. Sterling, F. A. Beckwith, L. C. Hanna and G. B. Morley, all of Cleveland.

The Masons' Supply Company was formed several years ago by a number of contractors. It has offices in the Schofield Building. E. W. Reaugh is president; L. Dautel, vice-president; H. F. Walker, treasurer, and W. A. Fay, general manager.

Each of these big companies has several local supply houses, the Kelley Island having five, the Cleveland Builders' seven and the Mason's Supply three. The companies all do a large out of town business.

The Kelley Island Company has for years maintained a fleet of nine vessels, carrying lime, sand and crushed stone from Kelley's Island to Cleveland. It has the largest lime plants in the world. The Cleveland Builders' Supply Company has several large cement and plaster mills. Each company has represented a number of out of town manufacturing concerns which deal in supplies. The effect of the merger on these companies is interesting.

The new combine is almost entirely in control of the Cleveland field. It has been announced since the merger became known that Robert C. Mitchell, formerly with the Cleveland Builders' Supply Company, has organized the Contractors' Supply Company and opened offices in the Rose Building. This new company expects to do a general supply business in building materials.

Stone Plants Merge.

LIMA, O., May 11.—The Bluffton Stone Company, with general offices in this city, has recently purchased the plant and acreage of the Buckeye Stone Company, near Bluffton, the consideration being $10,000. The combined plants are merged in a $50,000 corporation, of which Allen Patterson, of this city, is president.

Gottschalk & Co., Dover, Del., have obtained a charter to engage in the manufacture and sale and to generally deal in building materials. The incorporators are H. Gottschalk, James S. Young, of Burnham, Pa., and George G. Taylor, of Reedsville, N. J. The capital stock is $125,000.

TOLEDO RETAILERS

Something About the Handling and Marketing of Builders' Supplies in This Thriving City.

TOLEDO, OHIO, May 15.—A visit among the retail builders' supply men finds conditions somewhat quiet this spring. There is not the usual activity in this section, though no complaints were heard.

The supply men of this city are a congenial lot of men and they all get along well with their competitors. It is a pleasure to call on competitors and not hear the usual ranting against this and that man for something he has done or not done.

While prices of materials, like all other places, are at the lowest possible figure, the retailers are accepting the situation with as good grace as can be shown under the existing conditions.

There are several features of the supply business in Toledo peculiar to this locality. Teaming, for instance, is nearly all done by contract. The teamsters as a general rule own their own wagon and team. They have an organization which sets a price for hauling materials, distance and the kind of team and load, being considered. By this method each man makes as much as he earns and the more trips the greater his revenue.

Another feature is the mixing of mortar by the retailer. Large mortar boxes convenient to the lime house and sand piles are arranged so that the men employed mix up putty, brown coat mortar, in fact anything required by a contractor. In this way instead of having to mix mortar on the job it has been thoroughly seasoned in the yard of the supply man. The contractor has no trouble with mixing and his mortar is delivered in any quantity required and as he wants it.

Toledo is not behind any city in up-to-date buildings and concrete enters largely in every structure of any size nowadays. The water filtration plant is one of the important engineering feats undertaken here which require large quantities of supplies such as cement, lime and sand.

The Toledo Baseball club will soon have its new ball park complete. In this one of the features is the concrete grand stand and the concrete fence which will enclose the park.

The new postoffice, long needed and looked for, has at last been put under way. Another important reinforced concrete job in the down-town district is the Thompson-Hudson Dry Goods Company's new store at Summit and Adams Streets. The foundations are being put in and work on the superstructure will be pushed forward as rapidly as possible.

The Toledo Builders' Supply Company.

The general offices of the Toledo Builders' Supply Company are at 420 Spitzer Building. The officers of the company are men well known in the supply business of the country and they occupy an important position in the life of this city. They are: Peter H. Degnan, president; A. R. Kuhlmann, vice-president; Richard Kind, secretary and treasurer; Jas. P. Degnan, manager; Thos. Doherty, superintendent; T. J. Degnan, superintendent of boats.

They have six yards in the city, where the supplies for the various contracts they have are distributed.

The Water Street yard also has their plaster mill, where Crœsus brand of hard wall plaster is manufactured.

The Cherry Street yard is the large distributer of sewer pipe and clay goods.

The St. Clair Street yard on Swan Creek makes sand the important part of its operations, while other supplies are carried in stock here, as well as at each of the other yards.

In the cement line they carry a number of the leading brands, among which may be mentioned, Wolverine, Omega, Universal, Atlas and Tiger. Lime, both lump, in bulk and hydrated are carried, mortar colors and numerous varieties of building and pressed brick as well as Ottawa (Ills.) silica.

Mr. Kind, speaking of conditions in building and supplies, said that they found their country trade off considerably this year. The backward spring and rainy weather kept the farmer from making the necessary improvements he customarily makes. Consequently the country supply man has not ordered much in the supply line. Their city trade is fair. Taken all in all, there is not enough building to take the output of the various manufacturers. He doesn't look for much of a pick-up this year. The railroads are making no needed improvements, on account of the unsettled condition of their affairs and the agitation which is now going on.

They have been furnishing the materials for the Toledo water filtration plant which is now rapidly nearing completion, the materials for the new Museum of Art Building, the materials for the new Toledo Postoffice and the materials for a reinforced concrete hotel.

The Buckeye Builders' Supply Company.

At the office and yard of the Buckeye Builders' Supply Company, Superior Street and Swan Creek, Mr. Muntz said that while there had been a spurt the past few weeks the supply business was rather quiet. He does not look for much of an increase this year.

This yard is where they do all their retail business. Their dock is equipped with a derrick to handle sand from the boats. All the supplies here are brought in by teams. In the cement line they handle Peninsular and Saylor brand. Lime comes from the Kelley Island kilns and plaster from the Grand Rapids Plaster Company at Grand Rapids, Mich. Sewer pipe, fire brick and clay from the various Ohio producers of these products.

They also do a large concrete block business here. They have a building built of hollow blocks where the three machines are operated. The blocks are cured on the yard. In the manufacture of the blocks, the yard gang when not otherwise employed or on rainy days, make blocks so that they always have plenty to do even when the supply business does not keep the laborers fully occupied. Mr. Muntz says that the concrete block business is a very profitable side line, as many contractors to whom they sell building materials also buy building blocks of them.

Their yard in the west end is located on the Michigan Central Railway and here they receive all their supplies, though sand and crushed stone are the principal lines here. All the large contracts are teamed from this yard.

The Peoples' Builders Supply Company.

The People's Builders' Supply Company have their office and yard at 722 to 744 Water Street. "This is the largest single yard in Toledo," said the manager, Harry Blum. They have a railroad switch into the yard, as they are located on the line of the Pennsylvania Railroad. They also have an excellent situation on the river and docks to receive supplies by boat.

In the line of cement they handle Medusa, Penn-Allen, Lehigh and Burt brands. Lime sold comes from the Ohio and Western Lime Company and John D. Owens. Woodville Hydrate is also handled. The sewer pipe, and other products of the Robinson Clay Products Company complete this line.

Speaking of business, Mr. Blum said that it was good with them considering conditions in Toledo at the present time.

The W. O. Holst Builders Supply Company.

The W. O. Holst Builders' Supply Company have two yards where supplies are handled. The main yard on South Erie Street and Swan Creek is the retail yard, where the main office is located also. Here they direct the deliveries of the materials and carry a complete line of supplies for the trade. Their sand operations are very large, as their docks are advantageously located, as described on another page.

In the line of Portland cement they handle Atlas, Lehigh and Wyandotte brands. They handle Kelley Island lump lime and Woodville hydrate.

Like the other supply companies they mix mortar for the contractor and Mr. Holst has been investigating the machine mixing plants with the view of establishing one here. He believes that this is much better than the hand mixing proposition.

At their other yard they handle sewer pipe and crushed stone in wholesale lots.

The Ohio Builders' Supply Company.

The office and yard of the Ohio Builders' Supply Company is located at the canal on South Erie Street.

The officers of this company are: Otto Augsbach, president; R. E. Do Ville, vice-president; R. M. Quick, secretary, and E. Do Ville, treasurer and general manager. A. J. Whitford, who was secretary of the National Lime Manufacturers' Association, is the city representative.

The warehouse of this company is arranged so that supplies are easily handled. In this, they keep their Portland cement, of which they handle Alpha, Atlas, Lehigh and Whitehall brands. They handle Sackett Plaster Board and a complete line of building paper. They also handle Higginson's Dental Plaster and Marble dust manufactured by the Higginson Manufacturing Company of Newburgh, N. Y.

The lime houses are kept in the yard. In this line they sell the John D. Owens lime and Woodville hydrate.

The yard, which also has a dock on the canal, receives sewer pipe and tile by this way.

In the basement of the warehouse, a concrete block equipment has been put in and they are now making and selling concrete building and chimney blocks. After the blocks have been made on the machine they are allowed to cure for a while, after which they are immersed in a concrete trough for forty-eight hours. They are now using hydrated lime to waterproof the blocks and excellent results are obtained.

The plaster mixing plant, a short distance from the yard, manufactures the Economy brand of wall plaster.

They also have several mortar mixers and supply the contractors with their mortars.

Speaking of business, R. E. Do Ville said that their business had shown a good increase over last year, though the season had held back building operations to a considerable extent. He thinks that there will be a lull during the summer this year which the supply man will feel very materially.

CHICAGO'S ACTIVITY

Unremitting Growth of the World's Greatest Building Material Market and its System of Distribution.

Chicago uses more lime, more cement, more plaster and more building material of every kind than any other city in the world. When Chicago was destroyed by the great fire of 1871 it was rebuilt in two years, better and greater and more beautiful in appearance than its people ever hoped to see their city in many years. Since that time many if not most of the buildings erected after the great fire as the pride of its citizens of that day have been torn down and buildings ten to twenty stories in height have taken the place of five-story buildings, which were the highest known previous to that time. In fact what the fire of 1871 destroyed by razing buildings was not any greater than the razing of buildings since demanded by the growth, the progress and the spirit of Chicago.

The indomitable "I Will" spirit has existed in Chicago since its beginning. Obstacles and difficulties disappeared before it and improvements in streets and buildings were continual and incessant, no stoppage at any period or in any year. In the early sixties the level of the streets in the business district was raised some sixteen feet, which necessitated the raising of whole brick blocks that number of feet on all the streets. This was a tremendous undertaking, not only in the matter of cost, but also in the practicability of accomplishment without damaging the buildings.

It was believed in those days to be an impossibility, and when a Chicagoan, none other than George M. Pullman, proposed to accomplish this unheard of feat of raising brick buildings on jack screws he was laughed at by every one. Nothing daunted he took contract on contract, raised building after building and successfully earned a great deal of money and besides a great reputation. The "I Will" spirit dominated him, and success crowned his efforts. A short time before the fire of 1871 the building of tunnels under the Chicago river at Washington and LaSalle Streets was agitated to connect the West and North Sides with the business district, to facilitate traffic, as the bridges then were a greater annoyance than they are now, causing great delays by their frequent openings, allowing vessels to pass. No time was lost in building these tunnels, which were completed shortly before the fire and were one of the wonders of the world for several years.

During the entire period of Chicago's existence no improvement, no enterprise has been too great or too costly for it to undertake and no undertaking has ever proved a failure.

Last year the cost of Chicago's building operations mounted up to more than sixty-eight millions of dollars.

The quantity of cement, brick, lime and other building material necessary in building operations is something enormous, and supplying all this material promptly and economically would be a problem hard to solve but for the men who have devoted their lives and fortunes in this business, which has given them an experience in handling this material and makes the task seem an easy one. It will be a matter of interest to every one to read the continued story of the ways and methods these men use in handling and supplying material to the builders.

Meacham & Wright Company's general offices are located on the eighth floor of the Corn Exchange Bank Building. It is the only firm which deals exclusively in cement in Chicago. The firm does a very extensive business, which requires the use of four large warehouses, one located in each of the three principal divisions of the city, and one central warehouse located on Sixteenth Street. All of these warehouses have rail connections and their location has been chosen for the purpose of facilitating prompt delivery in their respective districts, restricting by this means

(Continued on page 55.)

SAND AND GRAVEL

METHODS EMPLOYED

By the Toledo Sand Companies in the Handling of their Product from the Time it is Reclaimed until Delivered on the Job.

TOLEDO, O., May 20.—The sand for this market is pumped from the Maumee River and Lake Erie, the greatest amount coming from the lake.

In the spring when the sand boats are put into operation they are equipped with screens and suction pumps. The captain of the boat prospects around on the sand bars and makes examinations of the sand pumped. The sand drawn through the pump is screened and that which is not wanted is washed away by the flow of the water from the pump.

The boats pumping sand from the lake make one trip per day, while those which make the river trip make two trips per day.

There are four grades of sand used at this market, and they are classified as follows: Sewer sand, which is the coarsest; street sand, which is finer grade and used in concrete; masons' sand, which is used for mortar in brick work; asphalt sand, which is the finest grade produced, and used in the manufacture of asphalt. The first three grades are lake sand, while the asphalt sand is river sand.

When the boat is loaded, which process takes about two hours, it is brought to the docks, a distance from the bars in the lake of about fifteen miles.

Here it is unloaded by a derrick, which is operated by steam. The boom on the derrick is equipped with a two yard steam operated bucket or dipper, which unloads the sand either on the dock or into cars.

The various grades of material are piled in separate piles, so that when wagon loads are required the team may be driven to the pile and the wagon loaded by shovel.

The W. O. Holst Builders' Supply Company is the latest to enter the sand business in this city. While they have been in the supply business for a number of years they have always purchased their sand from the other producers.

Their yard is located on Swan Creek and they have splendid dockage facilities. One of the advantages is in having a switch from the Clover Leaf road so that cars may be loaded on the dock. The sand for the water filtration plant of Toledo is being shipped by this means and it is found to be the most economical way of delivering it.

The dock here has a storage capacity of about 2,000 tons. The accumulation in the summer and fall by the close of navigation reaches this amount, so that enough sand is carried through the winter to supply what demand there is during that season.

Nine hundred cars of sand were loaded at this dock last year for the water filtration plant, which is one of the largest contracts ever supplied in this section.

This company first began receiving sand this year on March 25. Up to the present time sixty boat loads have been delivered.

Two boats are in operation, one has a capacity of 250 tons, the other has a capacity of 100 tons.

The Ohio Builders' Supply Company have in connection with their supply business worked up a large and important sand business. E. Do Ville, the general manager, is a pioneer in the operation of boats. In the fifties he owned a tug, which operated on the Chicago River in the Windy City. In those days Twelfth Street was the city limits and the only means of transportation was by wagon and water. Naturally a large amount of this was by lake transportion and Mr. Do Ville said that he was always kept busy. Later he moved to Toledo and was one of the pioneers here. A few years ago he added to his fleet a steel vessel, the first of this type to be put into the sand business in this section. This type of boat, while it incurs a large investment at first proves profitable, for the few repairs required in after years keeps down the expense of maintenance. The wooden vessel requires a certain amount of overhauling and repair each season.

This company has the contract for supplying the sand this year to the municipal asphalt plant at Detroit. They also have large contracts at Mount Clemens, Mich., and Windsor, Canada. Their large steel boat is working near these cities to fill the contracts.

Their docks have ample storage capacity, where the various grades of sand are stored. It is equipped with a derrick, whose dipper has a capacity of two yards.

The Toledo Builders' Supply Company operate their fleet of sand boats in the same manner as the other producers. They have enjoyed a large trade in sand and have equipped each of their yards so that a supply of sand is kept on hand to supply their trade.

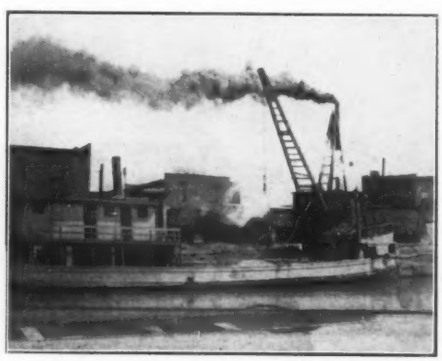
The St. Clair Street yard, which is on Swan Creek, has docks and a slip, where the boats are easily unloaded by their steam derrick. To facilitate the loading of wagons they have here large bins, under which wagons can drive and be loaded by gravity. The sand is lifted from either the boat or the storage piles into these bins, so that wagons are easily loaded without much labor or loss of time.

Richard Kind, secretary of the company, speaking of the grade of sand produced said that before the material was accepted by the Government for the Toledo postoffice samples had to be submitted for examination at Washington. The result of the tests were very satisfactory and the reports were very flattering to the producers.

New Gravel Company.

PRINCETON, ILL., May 10.—The Western Sand and Gravel Company, which owns the extensive gravel pit in the eastern part of Spring Valley, has been reorganized. The capital stock has been increased from $2,000 to $25,000. The principal offices will be moved from Princeton to that city and the board of directors will be five instead of three, as heretofore.

The pit consists of sixty acres of gravel of the finest quality. Experts who have examined it declare that it is one of the best gravels for road building that can be found in the Western States. It is the only gravel of its kind in this territory and always gave satisfactory results wherever used.



THE DUSSAULT UNLOADING SAND AT THE DOCKS OF THE W. O. HOLST BUILDERS' SUPPLY COMPANY, TOLEDO, OHIO.

A steam shovel and conveyor for loading on cars has been purchased and a stone crusher will be used in the near future. Work will be commenced in the new pit in a few days and ten men will be employed at the start.

The men interested in the new concern are J. S. Jane, of Monmouth; J. Whitehead & Son, of Farmington; J. B. Nelson and Fred Lindeman, of Chicago, and William H. Hawthorne, of Spring Valley.

Lease Sand Plant to Operate this Season.

WATERLOO, IA., May 1.—The sand pit formerly owned by M. B. Locke has been leased from the Riverview Improvement Company by Tony Bryant, of the W. A. Bryant & Sons Company, who will operate it this season. The demand for sand in paving and building lines is great in Waterloo. This is one of the best deposits of commercial sand in this vicinity, and the demand is so great Mr. Bryant contemplates putting in a Bucyrus one-half yard steam shovel, so the loading of wagons can be made more rapidly. With this shovel it will be possible to load a wagon every three minutes. The railroad company may extend a side track from the brickyard to the pit, and in this way cars could be loaded and sand shipped to the outlying cities.

Sand Plant Resumes Operations.

BARTO, PA., May 1.—After an idleness of several months the Hallman Sand Company has resumed operations with a full force of men. Numerous repairs and improvements have been made.

Will Build Addition to Plant.

PHILADELPHIA, PA., May 2.—The Philadelphia Quartz Company has awarded a contract for an addition to its plant at Chester, the price being approximately $7,500.

Sand and Gravel Company Formed.

FORT MADISON, IA., May 1.—A stock company has been incorporated to be known as the Fort Madison Sand, Gravel and Construction Company, with local offices in this city. The capital stock is $10,000. The incorporators and stockholders are T. M. Cox, A. J. Cline, R. N. Shaw, Galesburg, Ill.; John M. Hannibal, George H. Hannibal, St. Louis; Ernest Corsepius, Fort Madison.

The following are the officers of the company: President, J. M. Hannibal; vice-president, A. J. Cline; secretary, treasurer and general manager, Ernest Corsepius.

The object of the company is to deal in crushed rock, gravel and cement.

A pumping station will be located on the Des Moines River near the city of Des Moines, where a certain grade of gravel can be procured from the river bed. This gravel will be for building purposes. Another pumping station will be located on the Mississippi River between Muscatine and Rock Island, where sand will be taken from the river bed by a suction pump.

The pumping machinery is placed on flatboats and can be moved from place to place, where the best material can be found. It is the intention of the company to have a fleet of these flatboat pumping stations, which will be increased in numbers as the business may demand.

Fitting Out Their Fleet.

MARINETTE, WIS., May 1.—The Twin City Gravel, Stone and Sand Company, a concern in which Capt. James Larson, of Marinette, and John Riley, of Menominee, are interested, is preparing for a heavy season's work and the fleet of boats to be used in the business is now being fitted out.

A new tug has been purchased by the company and it will arrive in the local harbor in the near future. The big schooner Defiance is now being stripped of the top masts and jib-boom and will be used for carrying stone, gravel and sand. The Reliance is also being fitted for the business. A large scow was built by Captain Larson during the winter and this will also be employed in the business.

The company besides dealing in gravel, sand and building stone, will handle concrete block of all kinds and shapes.

Sand Company Reorganize.

The Deckers Creek Stone and Sand Company, Morgantown, W. Va., has been reorganized. H. R. Warfield is president and treasurer and E. H. Yeo, general manager. The new company has ordered all new machinery for their sand plant, and this will have a capacity of three hundred tons of high-grade glass sand per day. Steel foundry, engine and motor sand will also be manufactured. This sand has a very low melting point and very high per cent of silica.

The limestone plant has a capacity of seven hundred tons daily of ballast and fluxing stone. The limestone will be mined and enough orders are booked to run steady for seven months. This limestone will be used for furnace purposes. The plants are at Sturgisson, W. Va., on the M. K. Railroad.

Doing a Heavy Business.

GRAND RAPIDS, MICH., May. 12.—The Battjes Fuel and Building Material Company is doing a heavy business in gravel this season, with the pit at the plant between South Division and Buchanan Streets and another at Belmont in full operation. The output of the two pits is ten to twelve carloads and one hundred or more wagonloads daily, and this would be materially increased if teams could be secured.

The company is supplying the gravel for the new high school and the concrete foundations for the Wealthy Avenue and Commerce Street pavement and is shipping gravel to Muskegon, Big Rapids, Cedar Springs and other points.

Frank Aldershof and Frank Anker, of Schenectady, N. Y., and John Anker, of Cohoes, N. Y., are directors of the Holland Sand Company, of Schenectady, which has been incorporated with capital of $6,000.

The Aurora Sand and Gravel Company has been incorporated at Cleveland, Ohio, with a capital stock of $12,000. Frank Burter, A. J. Halle, William G. Guenther, A. S. Vait and David B. Stone are the incorporators.

The Muskingum Boat and Sand Company, of Zanesville, Ohio, was incorporated recently with a capital stock of $10,000. The company has a large acreage of fine building sand up the river and will bring it to this city. The incorporators are D. M. Weber, John Reed, Edward Underhill, G. M. Riley and Erwin C. Busch. The output of the bank has already been contracted for.

CEMENT

Cement Production in 1908.

The total production of all kinds of cement in the United States during 1908, as shown by returns received by the United States Geological Survey from all the cement producers of the country, amounted to 52,775,925 barrels, valued at $44,376,656. This total was made up as follows:

PRODUCTION OF CEMENT IN 1908, BY CLASSES.

	Barrels.	Value.
Portland cement	51,002,612	$43,472,679
Natural cement	1,621,862	808,509
Puzzolan cement	151,451	95,468
	52,775,925	$44,376,656

The corresponding figures for the calendar year 1907 are given below for purposes of comparison:

PRODUCTION OF CEMENT IN 1907, BY CLASSES.

	Barrels.	Value.
Portland cement	48,785,390	$53,992,551
Natural cement	2,887,700	1,467,302
Puzzolan cement	557,252	443,998
	52,230,342	$55,903,851

The Portland cement production showed a heavy decrease in 1908 as compared with 1907 in most of the Eastern and Southern States, the loss being greatest in Pennsylvania, New Jersey, New York and Michigan. This decrease in the East and South was offset, however, by remarkable gains reported by plants in the Middle West and on the Pacific Coast, returns from Indiana, Illinois and California showing large increases over the production in 1907.

The average price of the entire Portland cement output in 1908 was only 85 cents a barrel—36 cents below the average price in 1907. The 1908 price is the lowest on record, the previous low point—88 cents a barrel—having been reached in 1904 as the result of business depression in that year.

A report on the cement industry in the United States in 1908 is now in preparation, but this notice is published in advance of that report in order to place the total figures at the disposal of those connected with the industry at the earliest possible date.

The Cement Situation.

There is a more generally optimistic feeling among the cement manufacturers this month. Several of the big mills which closed down temporarily are again resuming operations and stocks are dwindling rapidly in the big warehouses.

There is a great deal of newspaper talk about the price of cement going down, but we are inclined to take a more hopeful view of the situation. There is really nothing to justify a lowering of the price of cement, as the orders are coming in at a more rapid rate than for some time past.

In looking over the reports of new construction one can readily see that there is going to be a vast amount of cement required during the coming season. It is customary for the daily press to magnify conditions and where some disgruntled competitor has lost a sale he is always given to saying that the other fellow cut the price. This the daily newspaper scribe grabs and puts into the paper, with the result that conditions become even more demoralized than ever.

The cement manufacturer has been talking too much.

Of course it is tough sometimes not to make a sale, where you thought you had every thing sewed up tight, but when you lose you should be game and take your medicine like men and not go out and tell the world that the other fellow is giving his cement away.

It is human nature to make excuses for not getting the business, but keep it to yourself, as the discussion of matters like this through the daily press can do no good and may do harm.

Building Plant at El Paso.

EL PASO, TEX., May 19.—A new 1,600-barrel Portland cement plant is being built here by the Southwestern Portland Cement Company. The plant is located about a mile from the city limits, on a tract of 900 acres, containing deposits of material from which the cement is to be manufactured. The plant is to be completed by October and the brand of cement will be El Toro.

A Salesman's Methods.

Selling cement is an art. There are really few great cement salesmen in this country. They are born and not made. Anyone can go out and sell cement when the price is right and the man is in need of cement, but it takes an artist to go out and get the top of the market and make sales where the other fellow can't.

Of course the first great requisite in the selling of cement is to advertise the brand well to the trade through the regular well established journals which represent the industry.

It is extremely difficult to sell an unknown brand and it takes a long time to gain the confidence of the users of cement.

It is generally conceded that a salesman has a distinct advantage selling a well advertised brand. There is no royal road to selling cement, as no two men can employ the same methods with equal success. In other words, what will succeed in one case will fail in another. In discussing the matter with one of the most successful cement salesmen in this country he gave some interesting information on the subject.

Of course his methods are not uniformly successful, but he succeeds many more times than he fails. He makes a friend out of his customer whenever he can.

A. F. GERSTELL, PRESIDENT ALPHA PORTLAND CEMENT COMPANY.

This is not always an easy matter, but this particular salesman has an ingratiating manner and seems to be able to win the confidence of the buyer in many cases.

The advantage is obvious. We will suppose that a big order is going to be given and the man has received prices on cement from a half-dozen concerns. These are not bids, so the dealer does not feel that he is in honor-bound to keep them. When our friend the salesman gets on the job he is told that he can have the order providing he can meet the price that is made by the man having the same kind of cement. This is what might be called injecting your personality into the sale. It doesn't always work to be sure, and the salesman runs up against it once in a while.

Of course, it is the general rule of cement companies to protect their agents in the various cities whenever possible. Where a big order is coming out it is customary to put one of the cement company's best men on the job even though the retailer is doing all he can. Of course he works in conjunction with the local dealer and frequently takes his cues from him.

It is a case of getting at the right man. It may be the architect, the engineer, the owner or frequently someone not mentioned at all in the case, but who is the power in back of it all. We have known of one brand of cement being specified but never going on the job. It doesn't always pay to lay down when you think that you have got the matter settled because there is "many a slip" and it is the smart salesman who can "put one over" on his competitor even after it looks hopeless.

He is usually the chap that draws the big salary. His methods are sometimes unique but he never gives up until he sees the other fellow's cement on the job. Perseverance wins in many cases.

The Chinese Government to Manufacture Cement.

Vice-Consul-General Willard B. Hull, writing from Canton, gives the following account of the establishment of extensive works by the Chinese Government for the manufacture of building supplies:

The institution, which is known as the Chinese Government Cement Works, will have a daily output of 500 barrels, each barrel weighing 375 pounds net.

The cement will be manufactured at a cost of about $1.15 a barrel, and they expect to put it on the market at $5 Mexican a barrel ($2.08 gold). This is 23 cents a barrel cheaper than the Green Island cement made in Hongkong, but if the competition becomes keen the Chinese can reduce their price considerably, as they expect to be able to manufacture the cement at a lower figure than it can be manufactured in Hongkong.

Absorbs Cement Company.

EASTON, PA., May 10.—The Portland Cement Company, of Allentown, Pa., with works at Evansville, Berks County, recently absorbed the Vidax Company, at Molltown, also on the Reading Railway's Schuylkill and Lehigh branch. The combined plants can produce 6,000 barrels a day.

A. F. Gerstell Elected President.

EASTON, PA., May 15.—At a meeting of the directors of the Alpha Portland Cement Company at the offices in this city A. F. Gerstell was elected president of the company, to succeed the late W. M. McKelvey, of Pittsburg. J. M. Lockhart, of Pittsburg, was elected vice-president, and G. S. Brown, of this city, was appointed to the vacant place on the executive committee.

Investigations of Deposits of Cement Materials.

A report on the results of the annual investigations of the United States Geological Survey into cement and concrete materials, which is about to be issued as an advance chapter of Bulletin 380, "Contributions to Economic Geology, 1908, Part I," covers progress in the three States of Colorado, Montana and Pennsylvania. The possibilities of the Niobrara limestone in Colorado as a source of cement are treated by G. C. Martin; the cement material deposits near Havre, Mont., are discussed by L. V. Pepperberg; and the nature and uses of ganister in Pennsylvania are described by Charles Butts. The chapter (Bulletin 380-J) can be had free from the director, United States Geological Survey, Washington, D. C.

The geologic formation known as the Niobrara limestone, which is composed essentially of limestone, though it contains calcareous shales, outcrops in the foothills of northern Colorado. The most favorable localities for quarrying it are at points where it rises in high ridges beside low valleys, which will permit the excavations to be kept dry by natural drainage and at the same time afford a large bulk of material. Such conditions exist at various points close to a railroad. Analysis shows that the limestone is eminently suitable for cement manufacture, being low in magnesia and in some places approaching the theoretical composition of a correct cement mixture.

Another source of possible cement material in the same region is the waste of beet-sugar factories, which use immense amounts of limestone in refining processes. The waste, which is entirely suitable for cement making, is at present not only worthless but costly to remove. It is increasing at the rate of about 57,000 tons a year.

Cement in the region of Havre, Mont., is especially important, as other building material is scarce. The materials, which are highly metamorphosed limestone and shale inclosed in igneous rock intrusions, will make a good cement. The deposit is local, covering only about eighty acres, but is probably sufficient to run ten kilns using 20,000 tons annually for twenty years. Sub-bituminous coal of good quality is available for fuel, but the water supply would probably have to be piped from Milk River. The market would probably be local.

The ganister quarried in Blair County, Pennsylvania, is used for making refractory brick for furnace linings. It occurs as a bed or beds in the formation known by geologists as the "White Medina" sandstone, which forms the crests of Tussey, Lock, Loop, Dunning and other mountains. Practically all used at present is obtained from boulders that mantle the mountain sides, having rolled down from the higher ridges. The supply available in this way is very

(Continued on page 52.)

Chuting the Chutes.

Nearly every man connected with the builders' supply trade, even if he is a staid Presbyterian, has at some time during the past few years been dragged out by a small boy or a big girl to spend an evening at the White City or some other outdoor amusement park, and has had a ride on the Chute the Chutes.

Therefore, you will readily remember when you got up on top of the hill and when you started down you were going some; when you hit the water you thought you had come to the end of never. This little amusement so illustrates the plaster prices that started at the head of the chutes in the memorable fall of 1907 and have been chuting the chutes ever since. It seems to be pretty nearly time for the boat to spring a leak.

Certainly no man can produce gypsum, make plaster, deliver it and make money on the present basis or the one we have had for twelve months past. The fellow who has been able to break even still has an even keel, but there's no telling how soon the chute the chutes boat will turn over.

After all possible economies have been secured in the manufacturing and sales department, and still your monthly statement shows red ink instead of profit, it is a lamentable condition, and one that should be remedied. Going up against some plaster manufacturers is as bad as ex-Secretary Root had it when he talked to the United States Senate windjammers. One is afraid and the other dare not come up like a good soldier and 'fess up to the fact that he is tired and has enough of this dog eat dog, chute the chutes business. They should get together, if for no other purpose just to shut the mills down and fill orders at cost plus 10 per cent for contingencies and be satisfied until business improves. While trade shows some little improvement right along, yet with the steady decline of prices someone is sure to get hurt, and one can hear the ringing in the ears right now as of the man who got his legs cut off by a freight train.

If anybody was gaining except the consumer by the present demoralization of prices in the plaster business it might be all right for a little while, but the idea of sensible, sane business men with their whole capital tied up in a manufacturing business to persist for two years on chuting the chutes when they are getting nearer to the brink of Niagara Falls every minute is the wonder without reason.

Buena Vista Company Changes Hands.

The United States Gypsum Company have purchased the plant of the Buena Vista Company at Plasterco, Va. This is a three-kettle mill with a capacity of 6,000 tons per month running a night and day shift. The United States Gypsum Company purchased this plant in order to take care of their increasing tonnage demand in the coast territory and the southeastern states. Besides manufacturing plaster for building purposes this mill furnishes a considerable amount of lime plaster to the peanut growers.

The United States Gypsum Company report conditions generally as very good. They feel very much encouraged over the outlook and say that they are getting their share of business. They cover a vast territory and are in a position to feel the pulse of the trade quicker than most any one else in the building supply business.

American Marmorite Company Organized.

SAGINAW, MICH., May 12.—The American Marmorite Company has been organized here to manufacture a new product called marmorite. This material is to be used to imitate marble for floors. Benjamin G. Appleby is the general manager of the company.

New Incorporations.

The Cincinnati Wall Plaster Company has been incorporated at Cincinnati by J. L. Walker and others, with a capital of $25,000.

Stonage Plaster Company, Englewood, N. J.; capital, $100,000; incorporators, William H. Peck, Alfred W. Haywood, Jr., and George Whitefield Betts, Jr. The company is to manufacture plaster boards, lime, chemicals, building materials, etc.

SPECIFICATIONS

Adopted by James T. Allen & Son, a Pioneer Concern, Based on Their Many Years of Experience.

PHILADELPHIA, PA., May 11.—The successful continuance of the business of James T. Allen & Son, J. Turley Allen, proprietor, plasterers, etc., 212 South Tenth Street, substantiates the old maxim that honesty will win out every time. This business was established by James Allen, grandfather of the present proprietor, in 1819, and carried on by him until 1843, when the firm style became James Allen & Son, which was changed in 1854 to Allen & Brother, which continued until 1859, when it was carried on by James T. Allen until 1884, when the present firm name was assumed. Although the father has been dead since 1897, J. Turley Allen has allowed the old well-known firm name to remain. From the beginning of the business it has been the rule of this house, from which it has never deviated, to live up to every promise and to do only honest work, consequently its reputation for reliability is unimpeachable and one to be proud of.

J. Turley Allen has made plastering and its kindred lines a life study, and his notes and suggestions from time to time are of great value to those desiring information on the subject. Especially will his suggestions for specifications and notes on plastering which have been obtained from him be read with interest. As is well known there is a great difference in the lime in various sections of the country. The notes of Mr. Allen apply mainly to the lime of this particular section.

WOOD LATHING SPECIFICATIONS

All ceilings, walls, partitions and under sides of stairs are to be lathed with best quality of spruce lath of full thickness and free from sap, bark and dead knots. Each joint is to be broken every eighth course and the lath laid with sufficient space to allow a strong key. All lath are to be securely nailed.

Note.—It is sometimes mentioned in specifications that best sawn lath are to be used. This is unnecessary, as split lath, against which this specification was intended to guard, have not been in the market for over fifty years. It is also usual to require dry lath to be used. This is a mistake, as much better results can be gained by using wet lath, and allowing the mortar and the lath to dry together. Mortar put on dry lath will make them warp and twist, and crack the mortar should the mortar set or harden before the lath have become saturated.

In regard to the clause frequently inserted in the plasterer's specifications for bidding the running of lath over or behind partitions, it would seem to be more effectual to instruct the carpenter so to arrange the studs and furring that it would be impossible to make anything else than a solid internal angle.

METAL LATHING SPECIFICATIONS

All ceilings, partitions and stripped walls are to be covered with metal lath, securely nailed in position and strained so that it will not give when the second or finishing coats are applied.

Note.—If metal lath are used the support should be sufficiently close to make a rigid wall. If ordinary wire cloth is used the space or centers should not be greater than nine inches.

This distance may be increased with some of the laths which in the direction of their stiffness are more rigid than plain wire.

It would seem, however, that the requirement of supports belongs more properly in the carpenter's specifications.

LAID OFF WORK

All ceilings, walls, partitions and soffits throughout the building are to be plastered with three coats. The brown mortar for this work is to be made of fresh lime, coarse bar sand and strong cattle hair. The lime must be run through a sieve of not less than five meshes to the inch, and used as soon as it is stiff enough to be worked. All lath work must be covered with first coat mortar made up as above directed and put on with such force as to insure a good clinch. This is to be followed immediately by second coat mortar made with a larger proportion of sand and less hair.

All other second coating in the building is to be done with this mortar. The surface of the second coat must be made true and even, flush with grounds and fairly out of winding. All angles must be made straight and true, all walls plumb.

When the mortar has become sufficiently set the entire surface must be made compact and rubbed up with a float or darby and all bumps or other imperfections removed. The surface is to be left so that the finishing coat will adhere firmly to it.

THREE COAT WORK

All ceilings, walls, partitions and soffits throughout the building must be plastered in the best manner, with three coats.

Each coat must be perfectly dry before the next is applied. The brown mortar for this work must be made of fresh lime, coarse bar sand and strong cattle hair, and the lime must be run through a sieve of not less than five meshes to the inch, and used as soon as it is stiff enough to be worked.

All lath work is to be covered with first coat mortar made up as above directed and put on with such force as to insure a good clinch.

The surface of the first coat must be left as rough as possible by being scratched with a broom or scratcher, so as to insure the adhesion of the second coat. It is also to be put on to such a thickness that the first coat when dry and the lath together may be strong enough to resist the pressure of applying the second coat.

When this mortar has become perfectly dry all ceilings, walls and partitions throughout the building are to be covered with second coat mortar, made with a larger proportion of sand and less hair. The surface of the second coat must be made true and even, flush with grounds and fairly out of winding. All angles must be made straight and true, all walls plumb.

When the mortar has become sufficiently set the entire surface must be made compact and rubbed up with a float or darby and all bumps or other imperfections removed. The surface is to be left so that the finishing coat will adhere firmly to it.

Note.—It is usual to specify that mortar must lie in the bed for a given length of time varying from one to three weeks. Because the limes made in this part of the country are in combination with over forty-five per cent of carbonate of magnesia the mortar made from them sets. When the slaked lime has lain in the bed until it becomes stiff, and is then broken down and tempered, a very considerable proportion of the strength that it should ultimately have is lost. The mortar should be put on so that the setting will occur in place and not in the bed.

The loss of lime water while lying in the bed is also very harmful, as mortar made with these limes never becomes as hard on the wall after it is retempered with clean water as it would have been had it been used before the addition of more water became necessary.

Lime that has lain in the bed for some weeks and is then tempered down will work freely under the tools with a much larger proportion of sand than is required by lime tempered in a few days or as soon as it can be worked. Such an addition of sand, however, does not add strength to the mortar, but is simply an economy on the part of the workman at the expense of the quality of the work.

It is sometimes urged that lime should ripen in the bed in order that all the particles should become thoroughly slaked. This is an error, because unslaked particles should be taken out with a sieve at the mouth of the running-off box.

Any pieces of lime that will go through a mesh of a No. 5 sieve will slack out before the mortar can be used.

Care should be taken to use coarse as well as sharp sand in order that the voids may be of such size as to hold enough lime to cement the grains together securely and at the same time by the close contact of the grains to lessen the possibility of shrinkage of the mass and map cracking.

No small part of the advantage of rubbing up the second coat mortar thoroughly is that it is thereby made more compact than it was when originally applied. This is urged for the same reason that cement concrete should be made with as little water as possible and also be thoroughly rammed. It also follows that stronger work can be made when each coat dries separately, because the second can be made much more dense by being forced against the dry first coat, whereas in laid-off work this force cannot be applied, as it would simply result in all the mortar being pushed through the keys.

WHITE COATING.

The finishing coat must be composed of lime putty with a small proportion of white sand gauged with plaster of paris. This coat must be run on with such force as to insure a bond to the second coat and must be troweled to a burnished, even and straight surface, free from chip cracks or other defects. In no case is raw stuff to be run on and finished with gauged stuff. The lime from which this white mortar is made must be run through a sieve of not less than ten meshes to the inch. Neat quirks must be cut at all angle beads.

SAND FINISH.

The mortar for the sand finish must be composed of clean white sand and lump lime, which has been run through a sieve of not less than five meshes to the inch.

This mortar is to be put on with force and floated to an even and true surface, free from switches, float marks and all defects or inequalities.

STRONG ORGANIZATION

Employing Plasterers' Association of Chicago Have Solved Many of the Difficult Problems Which Beset the Industry.

The Employing Plasterers' Association of Chicago has been in existence off and on for the past twenty years. Since 1900 it has been on its present basis and is indeed, a model for the employers of other cities to follow.

The present agreement with the Journeymen Plasterers' Protective and Benevolent Society of Chicago is the fundamental principle of the association and this agreement is in force until 1912.

There are two classes of membership in the Employing Plasterers' Association, the full membership and the associate membership. Both lists make about one hundred members in all. The associate members do not pay any dues nor do they have any voice in voting power in the association. They also have an association of their own independent of this body. The full members of the association are the larger contractors who do the important and larger work in plastering. These employ a great many of the journeymen, and as they are the ones whose dealings are with the employers, the agreements are made to their best interests and are upheld by the smaller contractors.

The officers of the association at the present time are Oscar A. Reum, president; T. J. McNulty, vice-president and John C. Suttor secretary and treasurer.

The meetings are held once a month and oftener if necessary.

President Reum, when seen by a representative of ROCK PRODUCTS, said, "We have a good organization and get along with the Journeymen Plasterers splendidly. We work together and are doing all we can, jointly, to upbuild our craft which we think is one of the best that there is. We have an agreement with the Journeymen which is very satisfactory to both employer and employee. This is due to the fact that great care was taken when this agreement was drawn up. It represents the observations and results of many years' work of both our committee and that representing the Journeymen. I am safe in saying that there is not a 'scab' worker in this city, so strict are our rules. Even during the times of last year when building was so slack, no workman's wages were cut and full pay was always given for work done."

"Mr. Donlin, who is head of the Journeymen in Chicago, is an energetic young man of considerable executive ability, clean-cut and progressive. His is the best type of a man to be at the head of the Union. We have found our dealings with him were always very satisfactory and while he stands out for union principles and the best interests of the workman, he is fair and straightforward."

"The Journeymen and Employers are not affiliated with any organization which has laws contrary to their agreement. Consequently we are not a part of the Building Trades Council of Chicago."

"The laborers employed by us also have a good organization, but we do not have as strong an agreement with them. They are affiliated with unions which may call sympathetic strikes."

"It has been our experience that if the workman is treated right, the best of relations will result. One thing we do not stand for any more is repairs. Any damage done in buildings to plaster work must be paid for by the ones doing the damage and this is an extra charge."

"We have a committee at work drafting specifications for plastering to be presented when the new code is presented for revision. The points to be covered are to have lathe nailed with ¾-inch space; the mortar shall consist of a clean sand and not any loam; the finishing coat shall contain 30% plaster of Paris."

"We stand for only the best of work in plastic materials."

"I am heartily in favor of a National Association of Employing Plasterers. The local Journeymen Associations are affiliated with the International Operative Plasterers, and the local laws are all based on those of their national body. If we had a National association we could work with the International and the best of results would be obtained."

The joint agreements working rules and rules of estimating between the Employers and Journeymen is as follows:

This agreement, made this 11th day of February, 1909, by and between the Employing Plasterers' Association of Chicago, party of the first part, and the Journeymen Plasterers' Protective and Benevolent Society of Chicago, party of the second part, for the purpose of preventing strikes and lockouts and facilitating a peaceful adjustment of all grievances and disputes which may, from time to time, arise between the employer and mechanics in the plastering trade, Witnesseth:

1. That both parties to this agreement hereby covenant and agree that they will not tolerate nor recognize any right of any other association, union, council or body of men, not direct parties to this agreement, to order a strike or lockout, or otherwise to dictate or interfere with the work, and that work can be stopped only by an order signed jointly by the presidents of the Employing Plasterers' Association of Chicago and the Journeymen Plasterers' Protective and Benevolent Society of Chicago, parties hereto, or the joint arbitration board elected in accordance with this agreement; and that they will compel their members to comply with this arbitration agreement, rules of estimating and working rules as jointly agreed upon and adopted; and that where a member or members affiliated with either of the two parties to said agreement, refuse to do so, they shall be suspended from membership in the association or union to which they belong.

2. A sympathetic strike shall not be a violation of this agreement, provided that the trade in whose interest the sympathetic strike is to be called offer and are refused arbitration of the matter in dispute.

3. Nothing in this agreement will be construed as preventing either the Employing Plasterers' Association of Chicago or the Journeymen Plasterers' Protective and Benevolent Society from joining a central organization, but it is distinctly understood that neither the Employing Plasterers' Association of Chicago nor the Journeymen Plasterers' Protective and Benevolent Society (parties hereto) shall have the right to join or become affiliated with any central organization which shall have any law or laws or pass any law or laws conflicting with or annuling this joint agreement, except as herein set forth.

4. Both parties hereto this day adopt the following principles as an absolute basis for their joint working rules, and to govern the actions of the joint arbitration board, as hereinafter provided for, to remain in full force until April 1, 1912, from April 1, 1909.

5. There shall be no limitation as to the amount of work a man shall perform during his working day. Each man shall do a fair and honest day's work.

6. No person shall have the right to interfere with the workmen during working hours. The business agent shall have access to all buildings being plastered by parties to this agreement. No person shall have the right to give orders to the men during working hours on the building, except the employer or his representative. Any trouble arising on a job may be referred to the steward and employer.

7. The use of two (2) apprentices to each employer shall not be prohibited. An agreement as to the number of apprentices is hereby entered into, it being understood that apprentices shall be subject to joint rules here agreed to.

8. The foreman shall be the agent of the employer. The foreman shall be subject to the joint agreement while acting as foreman, and be subject only to the decisions of the joint arbitration board for any cause whatsoever while acting as foreman, and he must be a member of the Journeymen Plasterers' Protective and Benevolent Society.

9. All workmen are at liberty to work for whomsoever they see fit. A man can work for any employer who will give him work in his trade, it being understood that he shall demand and receive the wages agreed upon by the joint arbitration board in his trade.

10. Employers shall be at liberty to employ and discharge whomever they see fit, but all men shall receive the full wages agreed upon in their trade.

11. The steward shall represent the journeymen. He shall be elected by and from amongst the men in his trade working on the same building and shall, while acting as steward, be subject to the rules and decisions of the Journeymen Plasterers' Protective and Benevolent Society. He will, however, be subject to the same penalties for any violation of this agreement. No salary shall be paid to a journeyman for acting as steward. He shall not leave his work or interfere with workmen during working hours. He shall always, while at work, carry a copy of working rules with him.

12. Eight hours shall constitute a day's work, except on Saturday, when work shall stop at 12 o'clock, noon, with four hours' pay for that day.

13. Double time to be paid for overtime. Work done between the hours of 5 P. M. and 6 A. M. and also Saturday afternoons, shall be paid for as overtime. Double time to be paid for work on Sundays throughout the year, and no work shall be done on the following six holidays (or days celebrated as such): Decoration Day, Fourth of July, Thanksgiving Day, Christmas Day, New Year's Day and Labor Day.

14. It is hereby agreed that the journeymen shall be paid once every week, on Friday or Saturday afternoon. When a journeyman is discharged he shall be paid in full, and also when he is laid off, if he demands it, except when the layoff is caused by bad weather or other satisfactory cause. When a journeyman quits work on his own accord, he shall receive his pay on the next regular payday.

15. The minimum rate of wages to be paid to plasterers shall be 68¾ cents per hour, payable in lawful money of the United States.

The Following Branches of Work are Covered by this Agreement.

Plain and Ornamental Plastering.

16. No by-laws or rules conflicting with this arbitration agreement or working rules agreed upon, shall be passed or enforced by either party hereto against any of its affiliated members.

Rules of Estimating.

17. All ornamental plastering upon any building or job shall be let with or to the contractor having the plain plastering upon such building or job, and no member of the Journeymen Plasterers' Protective and Benevolent Society will be permitted to work upon any building or job where the ornamental plastering is let to other than the plastering contractor having the contract for the plain plastering on such building or job.

Patching of Plastering.

18. No person or persons employing members of the Journeymen Plasterers' Protective and Benevolent Society will be permitted to figure upon or take contracts for any building or job if the specifications for such building or job provide that the contractor for the plastering shall do the patching of plastering after other mechanics as a part of the contract price, and all such patching of plastering after other mechanics or the repairing of plastering damaged by others than the plastering contractor shall be paid for over and above the contract price and in accordance with the uniform scale adopted by the Employing Plasterers' Association of Chicago. Any person or persons who shall estimate upon or take any contract for any building or job in violation of this rule shall be fined five per cent of his contract price for the first offense, ten per cent of his contract price for the second offense and for a third default he shall be subject to such penalty as the joint arbitration committee shall decide.

19. No member of the Journeymen Plasterers' Protective and Benevolent Society shall be permitted to work upon any building or job for any person violating this rule, until all fines levied against the person so violating has been paid into the treasury of the Journeymen Plasterers' Protective and Benevolent Society.

20. In conformity with previous agreements by and between the Employing Plasterers' Association of Chicago, and the Journeymen Plasterers' Protective and Benevolent Society these rules of estimating shall go into immediate effect.

Working Rules.

21. The object of these working rules is to obtain a higher standard of work. All work shall be done in a workmanlike manner, and poor work shall be done over again by the man doing it, upon his own time and without expense to the contractor.

Scratch Coat.

22. All scratch coating shall be well covered with a good fair coat of mortar, and well scratched. Where lime mortar is used, the scratch coat shall be dry before the second or browning coat is applied.

Patent or Hard Mortar.

23. The first coat in patent or hard mortar may be "doubled up" as soon as the first coat has "set."

Browning.

24. One coat work on tile, brick or wooden lath, shall be well laid on and darbied, and the angles rodded and floated when fit. Browning over scratch coat shall be rodded and floated and made straight. Patent or hard mortar need not be floated.

Float Sand Finish.

25. Shall be laid on even and well floated with a float and brought to an even surface.

Hard Finish.

26. Shall be well gauged and troweled, and angles made straight.

Coves.

27. That are bracketed by iron men or carpenters may be done with rod and darby. Where they are not bracketed as above, coves shall be run with a mold, and ceiling and walls shall be screeded, and rods shall be put up to run from.

Bull Noses.

28. All bull noses shall be run with a mold.

Gauged Mortar.

29. Where gauged mortar is used, the first coat may be doubled up and finished as soon as it has set.

Work on Wire and Metal Lath.

30. All work on wire and metal lath, where a finish coat is desired, must be done with three-coat work.

Lumping.

31. No person employing plasterers shall lump a job or any part thereof to any journeyman plasterer so employed, and no journeyman plasterer shall be allowed to work on any such job.

Work.

32. All work shall be done in a good and workmanlike manner, and the employer shall allow a reasonable amount of time to have same done, and any journeyman plasterer failing to do so shall be compelled to do the work over again at his own time and expense. The joint arbitration committee are hereby empowered to judge any and all work in dispute, and their decision shall be final in all cases.

Patent or Hard Plaster.

33. All hard plaster shall be used in accordance with the directions of the manufacturers making the same.

Segment Tile Ceilings.

34. Nothing in these rules shall be construed as requiring segment tile ceilings to be run with molds.

Ornamental Work.

35. Any ornamental plastering work may be cast complete and stuck up by members of the Journeymen Plasterers' Protective and Benevolent Society, provided such ornamental plaster be cast from mitre to mitre.

36. All work on concrete shall be browned.

37. All cement coating or plastering behind encaustic tile shall be done by plasterers.

Original Contractor.

38. The original contractor must finish a job or any part thereof for which he may have a contract, and no journeyman plasterer will be permitted to work on such job for anyone except such original contractor, unless

(Continued on page 51.)

Lime

National Lime Manufacturers' Association

Meets Semi-Annually.

OFFICERS.

William E. Carson, Riverton, Va.....President
Charles Weiler, Milwaukee, Wis.....1st Vice-Pres.
Walter S. Sheldon, Hamburg, N. J.....2nd Vice-Pres.
M. H. Deely, Pittsfield, Mass.....3rd Vice-Pres.
C. W. S. Cobb, St. Louis, Mo.....Treasurer

EXECUTIVE COMMITTEE.

William E. Carson, ex-officio; Chas. Warner, Wilmington, Del.; T. E. Fleischer, Sheboygan, Wis.

The Semi-Annual.

The seventh semi-annual meeting of the National Lime Manufacturers' Association will be held some time during August at Atlantic City, N. J. All lime manufacturers should arrange to take their holidays at that time, and to attend this meeting. Atlantic City is one of the world's famous watering places and summer resorts. Those who have not been there will have an opportunity to visit this wonderful place, while those who have once enjoyed the cool sea breezes on the board walk and a dip in the ocean will receive with pleasure the announcement of this meeting, that they may again enjoy the pleasures afforded there.

The Lime Trade.

When the National Lime Manufacturers' Association was launched in November, 1902, its objects were to bring the lime trade together from Maine to California to exchange information on how to make good lime at a minimum cost, and distribute same in as large quantities as possible in the most intelligent way.

Before that time, organization was practically a joke in the lime trade, although locals had been formed in the Southeast, East, West and Central West at different times to harmonize the interests of the manufacturers, with indifferent success. The active men in the lime association in the past are still on the firing line, although in some cases they have passed the mantle to the shoulders of some younger man in the trade.

The National Lime Manufacturers' Association has been an influence for good all the time. Had it only succeeded in influencing and mothering the two or three local organizations that have been in existence ever since, its object in life would have been accomplished, but it has been more instrumental in securing better results in the manufacturing line because of the influence of its educational features and the mixing up of lime men from one end of the country to the other.

But, gentlemen, there is a much greater need today for the enlarged effort of this association than ever before. Through the broadgauged efforts of men who go on the floor of these conventions and practically open up their books to their competitors business is conducted on a very much better basis than ever before. But there are many channels of improvements to be made, and the influence of the national association is the only one that can achieve it successfully.

One of the weaknesses of the national association was the inability to get manufacturers out to two meetings a year, but the first year or two, when we had semi-annual meetings, the association accomplished the most good. It elicited greater interest on the part of the manufacturer.

Now, then, through the efforts of this little Irish-Virginian president, who is about six feet tall, with all his other aggressive movements for the better interests of the association's membership, we are to have a semi-annual meeting in Atlantic City in July, and you no doubt will have to listen to lime men saying they are too busy to attend a meeting; but as a general proposition ROCK PRODUCTS would suggest that they better lose that "too busy" feeling and instead of firing kilns while the fireman goes off on a vacation if they will attend this meeting they can help add enthusiasm to the work of the national association, which is now in position to do things on a greater scale for the individual lime man than ever before.

Any one who read that interesting program at the Pittsburg meeting should not hesitate to respond to the call of their "doughty" general when he sounds the tocsin for all good lime men to get in line.

It is not often a craft has the privilege of having a red hot politician with the energy of a Napoleon to lead the procession, and, therefore, it is due to President Carson that every man on the job in the lime business should not only morally but financially support this association and be in attendance at every meeting.

Look out for the bugle call and spend your vacation in Atlantic City, and do not come for one day only, but stay a week if necessary to carry out the program, which will be both interesting and profitable.

New Uses for Hydrate

While in Kansas City the other day ROCK PRODUCTS had a visit with W. B. Hill, and incidentally met one of his customers, who is an apostle of hydrated lime. He is an engineer and has charge of the filtration plants of the Missouri Pacific System, which, by the way, since they have been using hydrated lime for purifying water and washing boilers, has been instrumental in securing better equipment all over the system, and the Missouri Pacific is so well pleased that it is adding further filtration plants and using more hydrated lime. Why should they not?

They secure greater efficiency for every engine on the road, and the boilers last longer, the engines are less often put in the shop for repairs, and it has been said authoritatively that the pay roll in the machine shops along the line has been reduced because of the fact that hydrated lime has solved the problem of purifying the water for boiler cleaning. Of course, the Missouri Pacific System used lump lime in times past, but since hydrated lime has been introduced it has simplified the handling and carrying of material; has secured greater efficiency in the purification plants and has reduced the cost of maintaining five hundred engines; incidentally it has increased the consumption of lime for this purpose. There are other fields to conquer, and the lime manufacturer should get busy with the railroads in his section.

Water Purification

If the directors of waterworks in the various cities who are spending so much time and money trying to secure an engineer who can invent some new purification process would put a good man at work to test out lime as a purifier for water he would make greater progress and spend less money in experimentation.

We have numerous examples of how much it costs the dear people to experiment in a number of cities, and outside of St. Louis and one or two other points they have not made any very satisfactory progress. ROCK PRODUCTS is on the job and fully prepared to show those who are perplexed the easiest, best and cheapest way out. We have done this and can do it again.

A Most Satisfactory Yield.

H. Dittlinger, president of the Dittlinger Lime Company, New Braunfels, Tex., in a recent letter says: "We have been obtaining a very satisfactory yield in our producer gas lime burning equipment. In a continuous run of three months and three days we got 3.65 pounds of lime to each pound of coal, the fuel value of which, by examination, is known to be 11,000 British thermal units."

The Dittlinger Lime Company completed their modern plant about one year ago. It was the first in the Southwest to be equipped with producer gas burning equipment and also the first to install a Kritzer hydrating plant. Their lime is a very high calcium product and has met with much favor in the markets within the limits of transportaion of the plant. In fact, the Snow Drift hydrate is now being shipped extensively throughout the entire Southwest.

Main Office is Removed.

In order to centralize their business and to be in a more direct touch with their customers, the Ohio and Western Lime Company have moved their main office to Huntington, Ind., and have combined their Toledo office with the same; still keeping a branch office at Marion, Ohio. The firm requests that hereafter all mail be addressed to their main address.

Further Particulars Concerning the Excellent Water System Used in St. Louis.

The original coagulating plant, which has been in use for five years, was built as a temporary affair, with the expectation it would be replaced with a permanent structure immediately after the World's Fair. Its cost, with all the necessary machinery and connections, was less than $10,000. The cost of changing the settling basins, in order to put in operation the purification scheme, amounted to about $25,000.

When the process was started, however, defects and new problems presented themselves in rapid succession, and it soon became apparent that the design for a permanent plant would have to await their solution. After three years of study and experiment plans and specifications were prepared for a fireproof building equipped with crushers, conveyors, elevators, feeders, mixing tanks and various other components of a complete plant. The handsome coagulant house recently put into service is the result, a description of which was given in a late issue of this journal.

This massive structure, which, with the necessary machinery in place, cost $100,000, is located over the massive intake pipe leading far out in the river to the pumps. Most of the space is taken up by eight circular bins twenty feet in diameter and forty feet high. They are used for the storage of sulphate of iron and lime and have a capacity of 10,000 cubic feet each, providing for a supply of these materials sufficient to run the plant for a month or six weeks being constantly on hand. The lime and sulphate of iron are automatically prepared and mixed and modern, up-to-date machinery displaces the crude methods hitherto employed, when the materials were conveyed by wheelbarrows and mixed by far less accurate means. The lime is now weighed by automatic scales.

The solution of iron sulphate is introduced into the water supply through an iron pipe leading down into the intake passage. Here it becomes thoroughly mixed with the river water in its journey to and through the big pumps. The milk of lime flows from the mixing tanks to a collecting receptacle, where it is diluted and cooled. It is then forced to the delivery well, which receives the discharge from the main pumps. Here it is well mixed with the water which has already been treated with sulphate of iron. Even before the impregnated water reaches the basin coagulation has set in and settlement begins as soon as the initial velocity of the entering water is sufficiently reduced. The water traverses six settling reservoirs, which are separated by weirs or wells. Slowly the fluid flows from one basin to another over the tops of the weirs, leaving a little sediment and filth in each compartment until, when the last is reached, it is clear and limpid. It is estimated that 90 per cent of the suspended matter settles to the bottom of the basin into which the water is first introduced, and the degree of improvement in clarification produced by the journey through the succeeding basins is not so marked, yet there is a vast difference between the quality of the water in the second basin and that in the sixth and last.

No better idea can be gained of the wonderful results obtained by the treatment than to see the plant in actual operation. The onlooker marvels when he sees the small pipe which conducts the iron solution to the intake shaft below the coagulating house, but it is impossible to see the quantity of water into which it is injected. At the delivery well, however, the milk of lime is visible as it is introduced into the fluid. The water plunges into this receptacle from three huge conduits, which lead up to the pumps. At one end of the well a four-inch pipe is seen, from which is flowing the white mixture of lime. The solution is not shooting out under a full head, but seems to merely drivel. Viewing the tremendous volume of water in which it disappears causes one to doubt its efficacy, but on reaching the settling basins a surprising result is manifest.

Medical authorities claim it now unnecessary to use filters. Before the coagulant plant was put into operation they were used quite generally throughout the city and were very objectionable where they were not cleaned sufficiently often. The predictions which were originally made regarding the result on a large scale, which the laboratory experiments indicated, have been more than realized and St. Louis now rejoices in an abundant supply and one of the best water systems in the world.

The Tiffin Lime and Stone Company, Tiffin, Ohio, has been incorporated with $40,000 capital. A. B. Greiner and others are the incorporators.

The Eden Independent Lime and Stone Company, Marblehead, Wis., has been incorporated with $25,000 capital. Those interested are H. Nost, C. Nost, L. D. Sander.

QUARRIES

CONCRETE ROADWAYS.

Charles W. Ross, C. E., Street Commissioner, of Newton, Mass., has given his experience with concrete roadways, especially resurfacing macadam roadways and the building of curbing and street bridges in a paper which was submitted in a contest arranged by the Association of American Portland Cement Manufacturers. The paper was awarded second prize and is interesting to our many readers as furnishing a chapter in the story of concrete roadways as printed from time to time in our paper.

Mr. Ross brings out some good points in his article and crushed stone men and concrete workers should find many valuable pointers in it.

Concrete streets and roadways have come to stay and there are many places in this country where they are no longer regarded as experiments. Mr. Ross' paper follows:

Without any doubt the time has come for a decided change in the method of constructing streets.

Up to the present time we thought a macadam road for a rural town or city was the best that could be built, but to our great surprise we find that our roads in many cases are being rapidly destroyed by the automobiles. It is not my purpose to find fault with the automobiles, as I thoroughly believe in them and think they have come to stay. It is only for us to prepare the way for them. In my opinion, this can easily be done by a change, not a radical one, but a slight one in our surfacing coat for streets.

In the first place, crushed stone or carefully prepared gravel screened into different sizes is the proper basis on which to build. This stone must be cemented together in some way to make it waterproof, as solid as a rock, and free from dust. These three things must be combined in the proper construction of a macadam street.

In the past few years we have tried many experiments. Some of them have turned out very satisfactorily, while others have been decided failures. We are not discouraged with the failures, but believe that the only way to obtain the highest standard is to meet the different conditions which are constantly arising.

We have been striving to overcome the annoyance that the automobiles cause from dirt and dust and this is a condition that we had not considered as being serious until within the past two or three years.

The general public has not come to the realization of the fact that every particle of dust taken off of the surface of the street means just so much of the road material being wasted, and to my knowledge, by actual count, we have from two to three thousand automobiles passing over one road in twenty-four hours. This road is in a place where the automobiles are allowed to go at a rate of twenty miles an hour, but there are many cases where no attention is paid to the speed limit. It can readily be seen that a heavy machine driven at a high rate of speed means that the roads are coming to grief in a very short time.

We have tried experiments with the different kinds of oils, tarvia, asphaltoilene, liquid asphalt, coal tar and terracolio. Up to the present time our experiments have been mostly surface or penetration treatments. They penetrate into the road enough to keep the fine material from being torn off, thus preserving the surface of the road, but we must go still further than that. If we build a street, it is not to be built for this year or next but for years to come, and is it not better to build the road of proper material to make it last rather than to constantly be obliged to surface it with some of the different preparations which are only beneficial for a short time, but which help the foundation of the road but very little, merely as surface treatments.

We have tried different preparations of Portland cement and some of the other preparations already referred to.

This photograph will show in a general way how the work was done.

The cement was mixed in large boxes, which were moved along as the work progressed and the material spread on the surface of the road.

The surface of the roadway had been thrown off by the automobiles and worn down to the No. 2 stone. It was two or three inches lower in the center than on the sides, while it should have been higher. The material was screened out and put back on to the surface of the road. Then we mixed up a grout of three parts sand with one part cement and made a very thin mortar. We spread it on with large coal shovels and swept it with brooms. That mixture very readily penetrated into the surface of the road, grouted together, flushed up on to the surface and made it perfectly smooth. The cost of the cement work on roadway was as follows:

Cement and sand	$371.63
Labor and teams (applying and mixing)	356.50
	$728.13

Surface covered, 9,939 square yards.
Cost per sq. yd. material.....3¾ cents
Cost per sq. yd. labor and teams.....3½ cents
Total cost per sq. yd.....7¼ cents

After about one year, the surface began to show signs of scaling off under the action of the wheels, and the opinion has always been that it is impossible to make a new coat of cement stick to an old surface after it has once set.

The experiment was tried by putting on a coating of tarvia A, also a preparation of coal tar just as it was taken from the gas works. This was heated to a temperature of about 180 degrees and spread on to the surface of the cement, swept down evenly with a broom and then a light coating of stone screenings or fine screened gravel applied, which I think I much prefer to the stone screenings.

The surface has been kept intact for over a year and the tar preparation on the surface is in good condition at the present time.

The cement foundation is as good as it was two years ago and for a light surface treatment on a macadam road I see no reason why it is not perfectly satisfactory. I would suggest, however, when we consider building a new road that we take into consideration the difference between hard and soft stone. The trap-rock costs about one-third more than the softer stone and in many cases it is almost impossible to obtain it, but with a softer stone, which can easily be obtained in almost any community, when made into a mixture of concrete, it will prove just as satisfactory for a road as trap-rock at a very much less expense. If you build a six-inch macadam road of trap-rock, it would cost about 60 cents per square yard: if built of concrete and a softer coat of stone used, it would cost from $1 to $1.20 per square yard. The cement adheres so much more readily to soft stone than it does to a hard trap-rock that I think the time has come for us to build concrete roads and cover them with a treatment of coal tar or tarvia or some of the liquid asphalts which will adhere to the surface of the road very readily, thus giving a solid foundation with a waterproof coating, a road that will stand all kinds of weather and wear much longer than the treatment of tar on the surface of a macadam road and also one that will be entirely free from dust.

In building a cement road, I think there is but very little need for expansion joints. If the road is properly crowned, with a good foundation, the surface of the road acts very much like a bridge and in my opinion will never heave or change its position enough to warrant any expansion joints. If they are necessary, as for instance, against a street railway track, thin strips of board about six inches wide set on edge make very good expansion joints. They need not be taken out, as they will wear down and fit themselves to the surface of the road in such a way that they will not be noticed. If it is thought best to remove them, they can be easily drawn out and the joint poured with any of the preparations that I have spoken of for the surfacing of the road, thus making a joint that will be elastic enough to take care of all the expansion or contraction that will take place.

In preparing the gravel concrete for a road, the gravel should be of various sizes, not over two and one-half inches nor less than one-quarter inch in greatest diameter and mixed in the proportion of five parts gravel to two parts sand and one part cement.

The concrete can be mixed in a concrete mixer, or if mixed by hand, the sand and cement should be mixed either in boxes or on a platform with sufficient water to make a soft mortar, then the stone and gravel should be united and thoroughly turned over and mixed. The work must proceed rapidly until the concrete is in place, and so thoroughly rammed that water flushes to its surface and all interstices are thoroughly filled with mortar.

Before forming the subgrade to receive the concrete base, all present and prospective sewer, water, gas and subway connections should be made and extended under the curbs, and all old and new trenches should be tested with a ten-ton roller, and depressions should be filled and wetted and rolled until solid. Provisions should also be made for all surface drainage, which should be cared for through a system of pipes connected with proper catch basins with grates to receive the water at the sides of the road. All this should be carefully attended to before the road is considered ready for the concrete surface.

The concrete mixture should be prepared in the following manner:

The cement should never be used directly from any original barrel or bag, because there may be more or less damaged or defective packages, each of which would form a bad spot in the work. This chance is wholly avoided by requiring that the contents of from five to seven packages shall be mixed dry in the cement shed before any is sent out on the work.

If it is decided to use gravel for a concrete mixture, it should be a natural water-washed gravel and can be taken from almost any good gravel bank that is free from fine silt or clay which will adhere to the small stone. This must be carefully guarded in order to be sure to get a mixture of gravel that is perfectly clean and sharp, as in my opinion, there is more concrete being spoiled at the present time by using a poor grade of sand and gravel than by using a low grade of cement. You should use the best cement that is possible, but by taking a poor mixture of gravel or sand, the whole substance would be a failure. Do not understand that I recommend a low grade of cement, for I thoroughly believe the best material obtainable is the cheapest in the end.

In buying cement, specifications should be carefully drawn up and tests should be thoroughly made. The quality of the gravel and the kind of sand that is used should be just as carefully watched as the specifications are for the cement.

The above mixture is wholly a preparation of different kinds of gravel, which if properly used, will make a very good quality of concrete.

If it is decided to use crushed stone, the quantities may be crushed from some of the softer grades of stone or granite, though the hardest and toughest is preferable.

Special care is necessary to see that the stone, before crushing, is clean and free from mud and clay. Stone unfit for macadam may serve the purpose when it shall be embedded in the matrice of mortor in the concrete.

The best results can be obtained by taking a two and one-half inch stone, the next size from half inch to inch and one-half, and the third size would be the screenings after the fine dust has been eliminated. If fine screened stone is used in place of sand, nothing finer than a kernel of wheat should be used. If the stone before crushing is not entirely clean, the crusher-dust should be excluded by screening. Clean gravel and sand may be used in place of stone with the same provision as to the included sand. Where neither stone nor gravel are available, as in the middle west, fragments of brick or of furnace-slag are often used as aggregates. In any case, the number of cubic yards of loose material for the aggregate will be twelve to twenty per cent more than the total cubic yards of concrete rammed in place.

The sand should be the sharpest and cleanest available, preference being given to pit-sand, of which the grains vary from fine to coarse. Sand containing five per cent of loam or clay is common and should not be used until washed.

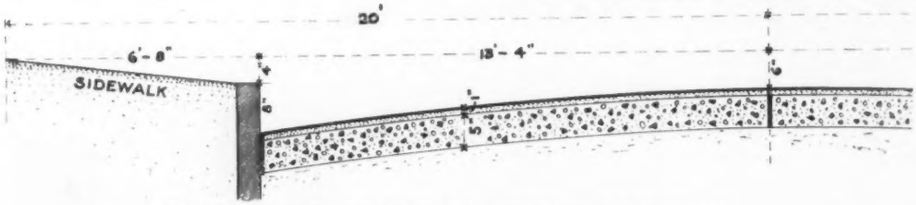
The proportions measured in loose bulk should be one part Portland cement to three parts sand to six parts of the aggregate. When the concrete is mixed by hand, the blended dry cement should be mixed on a mortar-bed while dry with the due proportion of dry sand, until the color is uniform and no streaks of cement can be noticed when the dry mixture is smoothed with the back of a shovel. Water should then be added gradually while mixing until plastic mortar is formed. The aggregate should be spread in a four-inch layer upon the platform, for which a sheet of iron ten feet square is the best, and on top of the layer is spread the mortar; the whole is turned with shovels. This mixing is continued until the face of every particle and fragment is perfectly coated with mortar, requiring hard work which must be done quickly.

The required amount of water varies, as the aggregates are more or less moist, so as to give a uniform result, for to be either too wet or too dry is a serious defect in concrete. The surplus mortar must be brought to the surface by ramming, after filling all voids. The effectiveness of ramming will vary on different works; the ease with which the mortar is brought to the surface varies with the amount of water, up to the condition where the concrete is so wet that no ramming is needed, which is bad practice, but not uncommon. The best practice is to use the least water with which the available rammers can be made to bring the mortar to the surface. It is useless to try to secure this necessary result by the persistent ramming of concrete which has been mixed too dry, and which it were better to remix with more and wetter mortar. There should never be enough water to produce free grout, which can drain away into the subgrade and be lost.

The most practical way to mix concrete for road work is by a portable concrete rotary mixer, as it is made better and more cheaply than it can ever be made by hand.

There are other mixers that are equally as good, but this happens to be the one that we have found to be

RESURFACING A MACADAM ROAD WITH CONCRETE MORTAR.



CROSS-SECTION CONCRETE ROADWAY AND SIDEWALK WITH STONE CURBING.

very satisfactory. It is operated by a gasoline engine, the whole being mounted on a truck, which can readily be hauled along the road as the work progresses. It is a light, durable and very satisfactory way of handling work of this nature.

The bags or barrels of cement can be carted to the sides of the road and the proper amount of stone and sand, as nearly as can be calculated, can be deposited near the gutters. The material can be shoveled into what is known as a coal bag, commonly used by coal dealers for delivering coal. The bag will hold about one bushel, and is much more practical than a basket, as the bags are lighter and can be transported from place to place very quickly. The stone and sand can be measured in the proper proportions and thrown upon the platform of the truck, then emptied into the mixer and the whole thing can be handled in a very cheap and easy manner.

The spreading and the ramming must be done so that each successive batch shall be rammed before the preceding and the adjoining batches have begun their first set. The stiffness of the concrete after ramming in place must be such that the fresh mass will retain its form and will not crumble when the boards are removed preparatory to filling the adjoining space. If properly managed, there will be no lines between the batches, which will all be merged into one mass.

Each day's work can also readily be bonded with the base previously formed, so that the whole will be a monolith, and should be left at night with a slope of about four to one. The whole slope will allow the next day's work to join on and should be coated with a portland cement mixture of one part sand to one part cement, which should be spread upon the slope before the next day's work is commenced. This will cause the whole thing to bond together so that the joint will not be perceptible.

When concrete has been rammed in place, it must be entirely undisturbed until it sets firmly, which should take from four to seven days ordinarily and longer in cold weather. It is of vital importance that the concrete should be kept wet during all this time, and that it be sprinkled freely at night and morning, and be covered from the sun by sand or canvas which will retain the water. It is a common thing to find experienced foremen who fully believe that concrete should dry out, and many pieces of otherwise good concrete have been rendered worthless by acting upon this idea. Traffic of all kinds, both by foot or by vehicles, should be kept from the concrete-base for at least a week if possible, using planks to cover street crossings where passageways must be permitted. Another good way is to spread a light coating of fine hay over the surface of new laid concrete and keep it thoroughly saturated with water for two or three days, as this will protect it from the sun and also retain the moisture. It is very necessary to have this work done before the freezing weather commences, as frost is very injurious to new laid concrete and should not be tolerated wherever it can possibly be avoided.

The objection to closing a street can be readily overcome by taking one-half of the street at a time, leaving the other half open for traffic. The surface of a concrete road should be coated about one-half inch thick with a mixture of good, sharp, clean sand and mixed in the proportion of two parts sand and one part cement. This should be spread upon the surface of the foundation coat, as soon as the foundation coat is laid, not allowing it to set before the surface coat is put on. Great care should be taken that these directions are carefully followed; if they are not, the top coats will not adhere to the foundation coat. This should not be rammed but should be swept with a broom, commonly called a push broom, which is a mixture of bass and rattan. It can be swept to a perfectly true and smooth surface while the cement is soft. After it has been allowed to dry out and before the road is opened for traffic, a coat of hot tar or tarvia or liquid asphalt, which has been heretofore described, can be placed upon the surface of the concrete. It should not be less than one-quarter of an inch in thickness when finished. The stone screenings should be carefully scattered into the tar, putting on as much as the tar will take up. This forms a surface that cannot be improved upon for a cement road, and in my opinion, it is absolutely necessary that this should be done, as a cement road is apt to be dusty, wears uneven, and gives more or less trouble if it is not coated with some waterproof preparation, which can be done at an expense of not more than ten cents per square yard.

I will now take up the subject of curbing and sidewalks, which, in my opinion, are a part of the road, and as much care should be given to their construction as to the road itself.

One of the best curbings that it is possible to make can be made from a mixture of concrete, using the same proportions of stone, sand and cement as are referred to in the specification for walls, bridges, etc.

The catch basins along the sides of the road can be built of a concrete mixture, the same as the foundation course for the surface of the road. These can be made in portable wood forms in the proper shape to suit the purpose for which they are required. As soon as the concrete is set, the forms can be removed, leaving the catch basins. In my opinion, the cement is fully as good as brick and can be built at a much less expense. I would recommend that all large sewers and surface drains be built of concrete in place of brick or pipe, as they can be built fully as cheap, that is, all sizes above twenty-four inches in diameter.

The following specification is a very good one for heavy walls, curbing, bridge work, sidewalks, etc. Concrete masonry should be composed of Portland cement, sand and broken stone or gravel screenings mixed in the proportions hereinafter specified. The cement should be a first quality Portland cement, made by manufacturers of established reputation and of a brand approved by the engineer. The cement should conform in quality to the requirements of the specifications of the engineer or whoever may be in charge. It should be packed in well made barrels lined with paper or in canvas or paper sacks. One barrel of Portland cement contains about 376 pounds of cement, four sacks of 94 pounds net being equivalent to one barrel. The cubic contents of one barrel is equal to about 3½ cubic feet. The cement should be delivered and stored as directed by the proper authorities at least two weeks before it is to be used, and the party in charge should immediately take samples and make such tests as are required in specifications. Any cement found of improper quality, or which is unsatisfactory, should be immediately removed from the work. After the delivery of the cement, it should be kept raised above the ground several inches by blocking or otherwise and properly covered from exposure to the weather and dampness.

The sand should be sharp, clean and free from vegetable matter or other foreign substances, and satisfactory to the inspector. The gravel or crushed stone should be of graded sizes varying from one-quarter inch to not over two and one-half inches in diameter except for the arches and parapet walls of the bridge, where no stone greater than one and one-half inches in diameter should be used. The concrete for the parapet wall should include all concrete above the sidewalk grade and consist of concrete mixed in the proportion of one part cement, two of sand and five of broken stone or gravel, except that all exposed faces of the parapet wall should be finished with at least one inch of sand mortar, mixed in the proportion of one cement to two of sand, the mortar to be colored with lamp black in the proportion of one-half pound lamp black to one hundred pounds cement. The top surface of the parapet wall should be trowel finished to a smooth, hard surface. Immediately after the removal of the forms, the exposed faces should be floated up to a true, smooth surface with a minimum amount of semi-liquid mortar colored as above. No plastering or patching should be allowed and defective parts should be cut out and replaced.

The concrete in the arches should be mixed in the proportion of one part cement, two of sand and four parts broken stone or screened gravel. The stone used should be of graded sizes varying from one-quarter to one and one-half inches in diameter. The concrete at the exposed surfaces of the arch rings may be placed directly against the molds, the stones being pushed back from the exposed surfaces with spades or trowels. After the molds have been removed, the exposed surfaces should be floated to a smooth finish with a semi-liquid mortar composed of one part cement and two parts of fine sharp sand, care being taken that no body of mortar is left on the face, sufficient only being used to fill the pores and give a smooth face.

The concrete used in the spandrel, wing walls and buttresses should consist of one part Portland cement, two parts sand and five parts screened gravel or graded sizes varying from one-quarter to two inches in diameter. These proportions may be varied slightly for the purpose of obtaining a dense concrete with all voids filled. The exposed surfaces of this class of concrete should, after the removal of the centres, be picked or bush-hammered to an even surface. The entire surface, except the corner borders, should be covered with the hammer marks, and sufficient hammering done to remove all marks of boards or forms.

The concrete placed in the abutment and pier should be mixed in the proportion of one part cement, three parts sand, and six parts broken stone. Boulders and other stones of solid texture may be embedded in the concrete of abutments and pier below the line shown on the plan as the limit of boulder concrete. No boulder or stone of more than four cubic feet in volume should be used. All boulders should be placed not less than six inches from each other nor more than ten inches apart.

The thorough mixing and incorporation of all materials should be insisted upon. Boxes or forms, satisfactory to the inspector, should be used to measure the materials for batches of concrete. The whole operation of mixing and laying each batch in place should be performed as expeditiously as possible, by the aid of machinery or a sufficient number of skilled men. No mortar or concrete should be used after it has begun to show signs of setting. If mixed by machinery, approved mixing machines should be used. The ingredients should be placed in the machine in a dry state, and in volumes specified, and be thoroughly mixed, after which water should be added and the mixing continued until it is thoroughly accomplished and the mass uniform. If mixed by hand, a mortar shall be first prepared in proper boxes for that purpose; the cement and sand, in the proportions specified, shall be thoroughly mixed dry, a moderate dose of water to be afterwards added to produce a paste of proper consistency, the whole to be thoroughly worked. The prepared paste should then be spread evenly over the pile of gravel, after the gravel has been sprinkled with water, and the whole mass should be thoroughly turned over, with shovels, not less than four times, and mixed until every particle of stone is completely enveloped with mortar. If concrete is mixed in batches requiring one barrel of cement, the platform, which must be water tight, shall not be smaller than ten by twelve feet. A larger amount than can be made with one barrel of cement should not be allowed to be mixed in one batch by hand.

Proper forms and mouldings, satisfactory to the inspector, should be provided and used by the contractor to fit the shapes of the work; and when they lose their proper dimensions or shape, they should be replaced by others. They should be smooth, tight and made of timber of such thickness and stiffness, and so braced that they will not quake under the ramming of the concrete placed therein; should be satisfactorily braced, secured and supported, and should be kept in place such length of time as the inspector may direct before striking. The forms and other limits of the various concrete structures are to be truly established and maintained by the contractor so that the completed work will conform in dimensions and position to the plans.

It is not wholly my purpose to illustrate the construction of the roadbed alone, but I have also included the sidewalks, bridges, curbing and all abutments and retaining walls along the lines of railroad tracks that pass through the different cities.

Why should we not try to make something that is ornamental and at the same time useful rather than to cling to the old methods of construction which were adopted many years ago when it was impossible to obtain money to build permanent works.

In proportion to the amount of money that is in circulation at present, it seems to me that we are far behind the times and are not as up-to-date as our forefathers were. We can readily see that they spent more in proportion to their income than is being expended at the present time by the different municipalities.

It is very gratifying to me to see this work progress and I think that the time is coming and in fact has already arrived, where it is up to the engineer and street commissioner to do the work in as thorough a manner as it is capable of being done. Good, thorough construction is always the cheapest in the end. It may cost a little more than you think it ought to in the first place, but after it is once completed, you and the public will be more satisfied than you would be with some unsightly, inexpensive, temporary arrangement.

A very good plan for a cobblestone paving for gutters is to lay the cobblestone on a bed of sand and have it thoroughly rammed; then mix up a grout of three parts of sand and one part cement and make a thin mortar, pour it over the surface of the stone and sweep it with a broom until it comes to an even, smooth finish on the surface. In most cases, it proves very satisfactory, as it will take care of the water very readily, be free from weeds and grass, and makes an ornamental finish for the side of the road.

I think that every municipality should be governed largely according to its own judgment in regard to how much money to spend, but should never think of being penurious in regard to street work. In many cities having a fine fire department, good schools, good water, good police protection, everything that goes to make a city attractive, you will still find the streets are kept in a wretched condition. This is both extravagant and unsatisfactory. If you can afford to build but one mile of street, build it well. The public at large will be much better pleased with even one mile of good street for an object lesson and will be more ready to make an additional appropriation for other permanent improvements in the same line.

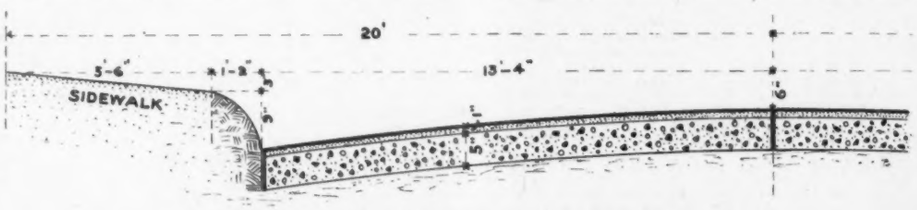
It is a wise economy to have plenty of steam road rollers, stone crushers and, in fact, all kinds of modern machinery, so that the work may be done as cheaply as possible.

I do not feel that all our roads should be built in accordance with the specifications previously mentioned, but as I have already stated, where permanent improvements are to be made and the sewer, water and gas pipes are already laid in the streets and in many cases the street railway tracks are already in place, there is no reason why this class of work should not be entered upon immediately. The public is always trying to obtain the best and the most that is possible for the dollar.

These facts are well worth considering and I am glad to see that the United States government and all the different states in the Union are being aroused to the fact that more money must be spent on our highways, and it is only a question of a short time as to just what that construction will be. There was a time when the log house was the best that could be afforded; in many cities and towns at present the people are living in the old-fashioned log houses and are not looking for anything better in the line of improvement over their fathers or grandfathers. It is a well established fact that every home is made better by good roads, every farm is enhanced in value, in fact, every municipality is made richer by the amount of money that is spent on improving the highways.

I have never yet heard a complaint made that a city is extravagant in regard to its highways. In many cases the amount of money appropriated for that purpose is what is left after the other appropriations have been made and if they come short, it is very often taken from the street department.

There are many places where the money spent has been squandered through lack of judgment. In many cities and towns it is a common practice to shift the heads of the departments at each annual election. In my opinion, this is a grave mistake. If a man has done good work this year, he will be able to do better work next year and so on. If an official can feel that his term of office is depending wholly on his methods and quality of work, he will certainly take more interest in it and will not feel that he is obliged to build his fences in place of building his streets as soon as he is elected.



CROSS-SECTION CONCRETE ROADWAY, CURBING AND SIDEWALK.

Cost of Operating An Electric Shovel.

Portland cement manufacturers and quarry men who have been up against the excavating proposition should not overlook the electric power shovel as a means of mining blasted rock and other materials. This type of shovel has been demonstrated thoroughly reliable and efficient in many different classes of work and should appeal to anyone engaged in rock mining who has electric current available.

The electric shovel is cheaper to operate than the steam shovel for the reason that it requires no fireman and the expense of hauling coal and water is eliminated. The work of any shovel is more or less intermittent, waiting for cars, etc., but with the steam shovel, the steam must be kept up whether the shovel is working or idle. With the electric shovel, there is no power being consumed when the shovel is not working, as the instant the shovel stops working the power consumption stops. Again, on the steam shovel, the fire has to be banked every night so as to be ready for morning, while the power for the electric shovel is always ready and easily applied. There is always more or less trouble with leaky flues and steam joints on a steam shovel, while the electric shovel does away with all these little inconveniences and in addition there is very little noise or dirt connected with the operation of an electric shovel.

As an illustration of the cost of operating a shovel of this type, we give the following records of an electric shovel owned and operated by the Electric Gold Dredging Company, Central Point, Ore., which is being used for dry placer gold mining. The shovel is what is known as the Little Giant type, manufactured by the Vulcan Steam Shovel Company, Toledo, Ohio. It is mounted on traction wheels and carries a 1¼-cubic yard dipper. The electrical equipment is for alternating current, 440 volts, with 60 cycle, 3 phase motors as follows: one 60 h. p. motor for hoisting the dipper, one 30 h. p. motor for swinging the crane and a 30 h. p. motor on the crane for crowding the dipper into the bank. The car body is 23 feet long by 7 feet 8 inches wide. The shovel is equipped with an extra high crane, which admits of a dump 15 feet above the floor level and will dump out 20 feet either way from the center. It will make a cut 48 feet wide at an elevation of 8 feet, and will clear a floor 32 feet wide. The following letter from the president of the Electric Gold Dredging Company to the manufacturers gives an idea of the efficiency of this machine and also the cost of operating:

Gentlemen: The Little Giant special traction shovel purchased from you last year and equipped with one 60 H. P. and two 30 H. P. alternating current, 440 volt motors was put in operation by us for the dredging of placer gold in Jackson county, Oregon. The writer has had some experience with steam shovels, but this is the first electric power, but we do not hesitate in stating that the shovel in all respects is in our opinion more easily operated and at less cost than by steam. This, however, may be due to the cost of power which is purchased at about 1 cent per kilowat. Our records show that the cost of power is about ½ cent per cubic yard of material handled, and with two men handling the shovel our maximum work for ten hours has been 405 cubic yards, but I believe that this can be increased to 600 yards for each ten hours. Yours very truly,

ELECTRIC GOLD DREDGING COMPANY,
By H. A. Mansfield, President.

From the above it will be seen that the cost of digging this gravel is very low, but, of course, it would be hard to estimate the cost of such work in any particular quarry, as conditions and the class of material to be excavated differ considerably. One can easily estimate the cost of labor and power in his own locality, and when everything is considered it will be seen that the electric shovel is the cheaper. Where a number of such shovels are to be operated in a quarry, they could all be operated from a central power plant. The saving thus effected is obvious.

The Vulcan Steam Shovel Company has closed a contract with the Dolese & Shepard Company, Chicago, for two of the largest electric shovels ever built, viz., two 100-ton shovels, carrying four cubic yards dippers each. These shovels will be used for digging rock in the new plant of the Dolese & Shepard Company's quarry at Gary, Ind.

MICHIGAN BOULEVARD, CHICAGO. MAINTAINED ECONOMICALLY WITH TARVIA.

Road Preservation with Tarvia.

The report of Nelson P. Lewis, Chief Engineer of the Board of Estimate and Apportionment of the City of New York, issued as a result of his visit on b half of the Board to the First International Road Congress in Paris, contains the following sane and sensible reflections regarding the dust problem on macadam roads.

Three solutions of the dust problem and automobile traffic problem suggest themselves:

First—The speed of motor cars can be controlled by rigidly enforced police regulations, so that their effect upon the road will be no more destructive than that of the former horse-drawn vehicle.

Second—The motor traffic could be segregated and confined to roads built especially for it, and so constructed as to be dustless and unaffected by the rubber-tired driving wheels and high speeds.

Third—The roads could be gradually reconstructed with a binding material which will be proof against the disintegrating forces exerted upon them by motor cars running at high speed, and pending such reconstruction the roads could be so treated as to abate, if not entirely eliminate, the present nuisance.

The first plan is undoubtedly impracticable. To effectually police our suburban and country roads and prevent running at high speed would require an army of men, would involve enormous expense and would reduce the motor car, one of the most useful and remarkable mechanical developments of recent years, to a useless toy, if not an absurdity. It would be a confession of failure to cope with the problem and would be a long step backwards, and may be dismissed without further comment.

The second plan, the segregation of motor traffic upon roads, especially designed for it, might be possible, but would involve either a restriction of such traffic to very few roads or a duplication of the present highway system at enormous expense. This expense, it might be claimed, should be imposed upon those using motor cars, either by tax or toll, as in the case of the motor parkway on Long Island, a section of which has been completed and upon which were held the last Vanderbilt Cup races. This would mean that the cost of motoring would be so greatly increased as to be beyond the reach of any but the very wealthy. It would also be asked why, if the roads can be built to withstand this kind of traffic, the method should not be applied to our existing highways. Special motor roads will therefore be built, if at all, by private initiative and at private expense, as is the case with the one referred to on Long Island and will be used only for high speeding, which would be entirely inconsistent with public safety on the highways. Such a plan cannot be considered as a solution of the problem.

The third method, then, remains for serious consideration, and it is the one which was favored in nearly all of the reports presented to the congress which dealt with the question of construction.

It must be conceded that grit or stone dust of the same kind as that of which the road is built, sand, sandy loam and mixtures of sand and clay, are not suitable as binding material for roads which are freely used by motor cars. As stated by M. Maulieu, Engineer of Bridges and Roads of Paris: "Only a perfectly homogeneous roadway, of which all the fine surface materials are protected against being scattered, is able to stand the passage of the extra rapid vehicles in use today." Either the roadbed must be so hard and dense as to be unaffected by the traffic, or a more viscous and elastic binding material must be used. It is quite generally believed that some form of bitumen is best adapted to this purpose.

It will be observed in the foregoing that no consideration is given to oils, soapy waters or other materials whose purpose is merely to suppress dust after it is formed.

The viewpoint of the French engineers, as reflected in this report, is that the road should be designed to withstand the traffic to which it is to be subjected. This is undoubtedly the only correct spirit in which to approach the problem. A road which under automobile traffic produces a vast amount of dust and wears out so rapidly as to make the cost of maintenance very high, is simply unfitted for automobile traffic, and a continuance of that state of things can not long be tolerated.

Of all the methods for reinforcing the binder of a macadam road, the French, English and the best American practice selects a prepared tar. This material in three forms, suitable for various road conditions, is available in this country under the name of Tarvia. The density of the tarvia is varied to suit the character of the surface to which it is to be applied. For a new road, for instance, a very dense material called tarvia X may be had, which is sufficiently viscid to act as a binder in the large voids of the 1½-inch stone of a new road.

For use in the top course where the voids are much smaller, a lighter material called tarvia A is manufactured; and for the minute pores of an old road where there is to be no resurfacing, tarvia B, which

ELECTRIC SHOVEL OF THE VULCAN STEAM SHOVEL COMPANY.

GORE STREET, WELLESLEY, MASS. SURFACED WITH TARVIA X SHOWING CONDITION AFTER THREE MONTHS.

is an even lighter fluid, is supplied. In each case the effect of the tarvia is to act as a sort of soft cement between the particles of stone. The nearest parallel is the action of cement in concrete, but as tarvia never becomes brittle, the roadway is not rigid but resilient and waterproof.

A tarviated road, accordingly, does not break up under traffic but is simply rolled down and smoothed out. It is noticeably noiseless, a feature that will always attract the attention of those who drive from an ordinary macadam street on to a stretch of tarviated surface. A tarviated road looks very much like asphalt, and even on close examination, the ordinary citizen is liable to be in doubt as to whether the surface is asphalt or macadam.

A tarviated surface is not brittle enough to grind off any dust, and is accordingly cleaner than even an asphalt pavement, while dust that blows upon it from other roads is liable to be rolled in by traffic and prevented from rising again by the adhesion of the tarvia. It is in fact so like a pavement that in some cities it is cleaned by flushing with a hose, although so severe a test is more than a tarviated surface should be expected to stand.

A single tarvia application will produce dustless conditions for at least a season under heavy traffic. Under light traffic a road so treated will frequently remain dustless for upwards to two years.

The Chief Engineer of the Board of Estimate and Apportionment in the report quoted above speaks of the effect of tarvia on certain roads in the Borough of Richmond, saying, "It has been demonstrated that at an increased cost within the reach of any community, it is possible to secure a dustless road incomparably better adapted than is ordinary macadam to motor car traffic."

Quarries Have Resumed Work.

NEW CASTLE, PA., May 20.—The quarries of the Shenango Limestone Company, south of the Fifth Ward in Shenango Township, have resumed operations after more than a month shutdown.

Fifty men are now employed at the quarries. This is but a small proportion of the usual number of laborers, but it is confidently believed that the entire force will be put back shortly.

Quarries May Be Bought.

JOPLIN, MO., May. 18.—The Checo quarry, situated at the northwest limits of Galena, may be worked again soon on a large scale. A large firm of municipal paving contractors of Kansas City have opened negotiations for a lease, and if they secure it will employ from thirty to forty men. The firm contracts paving, in the construction of which crushed rock is put down and surfaced with macadam. The limestone rock of this section is said to be the best obtainable for the purpose. S. Ryan, owner of the quarry, said recently a deal would probably be closed.

Stone Quarries to be Operated.

NEW CASTLE, PA., May 19.—The quarries of the New Castle Portland Cement Company, situated on the line of the Western Allegheny railroad, are being steadily operated, and much stone is being quarried each day.

The quarries have enjoyed an uninterrupted run of prosperity for the past year and a half, and there has not been a single shutdown during that time. With the starting of the new cement plant owned by the same company conditions will become even more favorable, it is believed.

Waterville Quarries Purchased.

The Imperial Stone Quarries Company, Toledo, Ohio, has recently purchased the quarries located at Waterville, Ohio, formerly owned by the Flint Stone Company and operated by the Waterville Stone Company.

Louis B. Sisson, the new manager of the quarries, and sometimes known as the youngest quarry manager in Ohio, states that the company has a number of large contracts on hand, including one for the ballast for the Toledo, St. Louis and Western Railroad and, in fact, has all the business they can handle until fall.

Rock Quarry Incorporated.

The Eureka Trap Rock Quarry Company, Queens, N. Y., has been incorporated with a capital stock of $10,000 to quarry and dress marble and granite, erect buildings, etc. The incorporators are Joseph R. Walsh, Lawrence H. Dooley and T. John McKee, 20 Nassau Street, New York.

SAND-LIME BRICK

Compression Tests and Sand Lime Brick in Germany.

(Translated from a report published in *Tonindustrie Zeitung*. By Fritz Kloeck.)

An interesting comparative fire test has recently been made at the plant of the sand lime brick works at Auerbach, in Voigtland. The test was conducted under the government's official specifications. Three cubes of equal size, one of granite, one of natural sandstone and one of the sand lime brick composition were tested in compression. The three cubes were first placed in a specially constructed kiln in such a manner that the impinging flames from a direct gas blast could envelop the specimens from all sides. This kind of a fire was maintained continuously for one hour, after which all the samples were promptly withdrawn from the kiln and the full force of a stream of water at twenty pounds' nozzle pressure was turned upon them.

The temperature in the kiln was measured by the Seger-Kegel method, and the heats between 2120 and 2370 degrees F. were determined. This report was made officially by the Royal Saxonian Testing Laboratory, of Dresden, which further says: "The sandstone cube was entirely decomposed, that is, split and broken to pieces. The granite cube was split into several irregular pieces. Neither of the natural stone samples could be subjected to any crushing test, as they were practically destroyed. The sand lime brick, with a crushing strength at twenty-eight days old of 3,680 pounds per square inch, still showed by test in compression 2,984 pounds per square inch, consequently in this fire test it had lost only 17 per cent of its original compression strength."

Robert Guthman, of Berlin, the largest manufacturer of sand lime brick in Germany, sold during the year 1908 75,000,000 sand lime brick. Owing to the general depression in the building market the plant was operated only on limited time, the capacity being considerably in excess of 100,000,000 brick. The outlook for business in the present year is said to be much improved, as indicated by business already in hand and contracts to be closed, so that the big plant will possibly operate to full capacity the whole year. Better prices for the brick have been developed in the past year, which are now being quoted from $5 to $8 per thousand, according to quality.

Commenting on the sand lime brick industry in Belgium, the editor of *Brique Mortier et Bois* remarks: "No industry has made such a record in reaching perfection in comparison with the sand lime brick. Only a little over ten years ago the industry was started and we find it today at a stage where it is envied by all other trades. Overlooking the field in this particular line from the days of its beginning to the present time we, of course, find, like in all other enterprises, room for improvement. This is true especially in regard to the presses in vogue. In our opinion the best way to decide which press is the better is by observing the different qualities of brick turned out in the same plant where several presses of different types are installed. This is because the material to be pressed is the same, and all other conditions are alike, no matter whether they be favorable or not they are measured equally.

"We had occasion recently to make the following test on several samples of sand lime brick made in one and the same plant on two different presses under the most minute supervision. The differences of the two samples submitted to absolutely parallel tests are shown as follows:

Press A.	
Crushing strength (pounds per sq. in.)	3,564
Water absorption	12.98%
Specific gravity	1.83
Press B.	
Crushing strength (pounds per sq. in.)	1,720
Water absorption	17.02%
Specific gravity	1.70

"It must be borne in mind that material used in both presses was the same kind, of the same grading and the same percentage of lime was used in both mixtures, namely, 6.87 per cent. The brick of press B did not come up under identical conditions to the crushing strength of 2,504 pounds per square inch, which is the specified minimum for sand lime brick allowed to be offered upon the public market by the mutual agreement of the National Association of German Sand Lime Brick Manufacturers."

A prominent German manufacturer of sand lime brick reports in *Die Kalksandsteinfabrikaten* that he is the inventor of a special process which he has put into use in his works that enables him to make calcium-silica brick, having the enormous crushing strength of 14,000 pounds per square inch.

The editor of *Brique Mortier et Bois* in this connection remarks: "Although we do not doubt the veracity of the gentleman's statements, we will wait with interest his further developments until we are able to report more fully in regard to this remarkable claim."

Sand Lime Brick in the United States.

The value of the sand-lime brick produced in the United States in 1908 amounted to $961,226 and represented the output of eighty-seven plants, according to Jefferson Middleton, of the United States Geological Survey. In 1907 the output was valued at $1,225,769 and was furnished by ninety-four plants. The net decrease in the value of the output in 1908 was therefore $264,543.

As in previous years, by far the greater part of the total value was represented by the common building brick, whose output decreased in value from $1,030,913 in 1907 to $803,333 in 1908. There was also a decrease in the value of the front brick reported, from $188,221 in 1907 to $147,704 in 1908. Fancy brick and blocks showed slight increases in value.

More than thirty States reported an output of sand-lime brick in 1908, but Alabama dropped out of the list and Montana appeared. Michigan retained its position as leading State in this industry, reporting products valued at $138,809 in 1908, as compared with $172,840 in 1907. Florida stood second in both years, with an output valued at $117,040 in the later year as compared with $109,275 in the earlier, a gain of $7,765 in value of product. Pennsylvania also reported an increase in value of product from $48,410 in 1907 to $64,123 in 1908. California, Indiana, Iowa, Michigan and New York showed decreases, the largest decrease being reported by Indiana.

The largest number of plants was reported by Michigan, although the number decreased from thirteen in 1907 to ten in 1908.

The average price per thousand received for common brick of this character in 1908 was $6.33, as compared with $6.61 in 1907 and $6.71 in 1906; for front brick the average price was $12.76 in 1908, as against $10.96 in 1907 and $10.42 in 1906. It is apparent, therefore, that while common brick has decreased in price, front brick has increased.

A report on the condition of the sand-lime brick industry in 1908, prepared by Mr. Middleton, will be published by the Survey in the course of a month or more. This report will be available for free distribution and may be obtained by applying to the director of the United States Geological Survey, Washington, D. C.

Granite Brick Company Doing Business.

FREMONT, NEB., May 3.—The Fremont Granite Brick Company has commenced to do business and has just made its first shipment. One car of its product was shipped to Columbus and another is ordered for Prague. For the past few days the company has had a display of its output in the windows of Richards, Keene & Co.'s office, which has been attracting attention. The exhibit is intended to show the amount of water absorption of the brick, and the tests have emphasized that the local concern's article absorbs far less moisture than does the brick of other manufacture ranged alongside of it.

New Minneapolis Concern.

The Minneapolis Sand Lime Brick Company has commenced operations on its plant at University and Thirty-third Avenues N. E. The company uses what is known as the high-pressure process. The sand comes from the neighborhood and the lime from Mason City and Manistique, Mich.

The sand is ground and sifted and the lime is bolted. The materials are then mixed and pressed. The plant starts with a capacity of 25,000 brick a day and this will be doubled. The officers are: President, W. C. Brix; vice-president, S. M. Klarquist; secretary, Edward Shahen; secretary and treasurer, Herman Vogt.

Look Forward to Increased Business.

W. E. Plummer Jr., secretary of the Buffalo Sand Stone and Brick Company, Buffalo, N. Y., recently remarked, "We are looking forward to more business this year than ever before, as the building community are being at last compelled to recognize our product as one well worthy of specification in the best class of buildings."

FROM OUR OWN CORRESPONDENTS

PHILADELPHIA.

PHILADELPHIA, PA., May 15.—There has been a little flutter of improvement of late all along the line, but, while the lime kilns are being pushed day and night to fill orders, and an equal activity is noticeable in most of the builders' supply lines, cement has not shown a corresponding acceleration, attributable, no doubt, to a paucity of large building work, the extensive operation work being confined to rows of dwelling houses, which require little cement. However, the outlook is encouraging, as there has been more construction work planned of late, which may materialize at any time and give the looked for boost to the cement business, sending prices up to a more satisfactory figure. Reports coming in from the Middle West and other sections are optimistic, and it is the universal opinion that the tariff question, with its complexities, once settled, a general activity in all trades will follow.

Among the work in contemplation and in process of erection are:

By John McGraw, 116 houses in the vicinity of Greenway and Kingsessing Avenues, to cost $209,200.

Thirty-four two-story brick dwellings at Fifty-first Street and Springfield Avenue, by H. N. Diesel, to cost $113,100.

An eight-story concrete building on the southeast corner of Thirteenth and Arch Streets, for George K. Breintnall, the contract for which has been given to William W. Rea's Sons; cost $150,000.

Oliver Randolph Parry, architect, has plans for a reinforced concrete Dutch Colonial house, to be erected at Wayne, Pa., for Walter E. Andrews; also has prepared sketches for two two-family apartments at Wildwood, N. J. The buildings are to be constructed of reinforced concrete.

The same architect has prepared sketches for twelve reinforced dwellings for Worrall & Wilkinson, to be erected at Kennett Square, Pa.

Camp & Company have a contract for an eight-story concrete building, 34x114 feet, at 210 and 212 North Thirteenth Street, for Mershon Brothers, which will cost $100,000.

A flat house is to be built on the northeast corner of Thirty-fourth and Chestnut Streets on a lot measuring 100x114½ feet, according to plans by Milligan & Webber, architects, which will be four stories high, of Pompeian brick and terra cotta, and will contain thirty-three suites of housekeeping apartments. The building will cost about $200,000 and will be ready for occupancy in the fall.

James G. Doak & Company have a contract for a three-story garage, 70x220 feet, at the southwest corner of Twenty-first and Commerce Streets, to cost $35,000.

Permit was granted to J. E. and A. L. Pennock for a clubhouse to be erected by the Philadelphia Turngemeinde at the northeast corner of Broad Street and Columbia Avenue, to cost $175,000.

Alexander Ferguson will build 101 two-story houses at Cecil Street, below Chester Avenue; cost $177,200.

Daniel J. Regan is building eighty-eight two-story houses near Somerset and Taylor Streets; cost about $140,000.

Robert A. Patton will erect twenty-four two-story houses near Catharine and Fifty-sixth Streets; cost $48,000.

The clearing of the site for the large $2,500,000 building at Sixth and Walnut Streets for the Curtis Publishing Company is being pushed by Doyle & Company, contractors and builders.

T. S. Applegate has a permit to erect sixty-six three-story houses on Johnson Street, between Chew and Musgrave, to cost $344,850.

Philip S. Vollmer, Philadelphia, representative of the Atlas Portland Cement Company, 112 North Broad Street, is emphatic as to improved conditions. He says there has been a decided increase of orders since May 1, but unfortunately prices have not stiffened so far.

Henry Longcope, manager of the Alpha Portland Cement Company, 909 Harrison Building, states that the local is slower than out-of-town trading, but there are some good-sized jobs going on the boards, and he feels that a general recovery of business may be looked for simultaneously with the settlement of the intricate tariff question.

The Lawrence Cement Company, of Pennsylvania, 616 Harrison Building, reports business still a little slow and prices very unsatisfactory, but admits brighter prospects for the future.

The Charles Warner Company, 811 Land Title Building, is busy in all lines, and the Whiteland Lime Company, Keystone Lime Company, Cedar Hollow Lime Company and the McCoy Lime Company, in which concerns it is largely interested, have increased their capacity, and though working day and night, including Sundays, can hardly keep up with the rush demand.

The next meeting of the Association of American Portland Cement Manufacturers will be held at the Hotel Traymore, Atlantic City, N. J., on June 24, 25 and 26. The genial secretary, Percy H. Wilson, wishes it understood that he will be on the job.

Richard L. Humphrey, of the National Association of Cement Users, 805 and 806 Harrison Building, reports association work progressing satisfactorily and the outlook for the cement business improving right along.

William A. Kramer, Philadelphia representative of the Pittsburg Water Heater Company, office Builders' Exchange, and his assistant, C. H. Ehrenzeller, are evidently too busy to argue over precarious conditions. They hustle for business with invariably good results.

William B. Harrocks, a well-known coal, lime and cement dealer at Arnott Street station on the Reading Railway, died recently. He was 36 years old.

William Call, a retired contractor and builder, died May 7, on his ninety-second birthday anniversary.

The Vulcan Fire Brick Company, Baltimore, Md., was chartered under Delaware state laws on April 30; capital $200,000.

The Refractory Fire Brick Company obtained a charter under Delaware state laws on May 12. Capitalization $350,000. Incorporators: J. L. Cohagan, Washington, Pa.; E. L. Squire and G. W. Dorsey, Wilmington, Del.

The Concrete and Clay Products Company was incorporated under Delaware state laws on May 12. Capital stock $500,000. Incorporators: Charles H. Bellamy, William Flint, Jr., and Henry E. Smith, of Philadelphia.

The Tidewater Portland Cement Company, Wilmington, Del., was granted a charter under Delaware state laws on May 13. Capital $4,000,000.

The usual annual baseball game between the Master Builders' Exchange baseball nine and the nine of the Lumbermen's Exchange, will be played at the Philadelphia Ball Park, Broad and Huntingdon Streets, on June 1. The proceeds of these games, as usual, will be devoted to charitable institutions, the Red Bank Sanitarium, the Children's Country Week, the Modified Milk Society and the Philadelphia Evening Telegraph Free Ice Fund. A large attendance is much desired.

BALTIMORE.

BALTIMORE, MD., May 15.—More money is being spent on concrete work in this city at the present time than ever before and a rough estimate would place the figures at several million dollars. Most of the work is being done by the city, but many private individuals are realizing the value of this character of construction and as a result are erecting their buildings with this kind of material.

Since the great fire, which destroyed the business section of the city in February, 1904, there has been a number of changes in the rebuilding of the city. With the up-to-date buildings erected and the widened streets, it was seen that an entirely new sewerage system was needed, and it was decided to spend $10,000,000 for this work. Contracts have been let for $5,646,859 worth of this work to the Metropolitan Contracting Company and M. A. Talbott & Company. This is about one-fourth of what will be spent.

The work was started about two years ago and since then hundreds of men have been at work on the construction. Concrete and brick are being used in most of the large work, which extends over a vast area. The main pipe near the new disposal plant is large enough for a street car to pass through and extends several miles to the city. A few days ago it was found necessary to appropriate an additional $10,000,000 to complete the work, so it will be several years before it is finished.

The new Forest Park reservoir is another piece of work that is being constructed of concrete at a cost of about $600,000. It is a solid concrete bowl 1,500 feet long, 700 feet wide, has an average depth of 30 feet and covers an area of 59 acres. When completed it will hold 225,000,000 gallons of water. The work is being done by Lane Brothers & Jones, whose bid was $584,432. The work has been going on about six months and it is expected to be completed in a year.

A new $10,000,000 dock system is nearing completion by the city. About half of the material used in this construction is stone blocks and the other half concrete. Considerable concrete and masonry work is being done in the various parks, besides miles of granolithic walks that are being put down in the new suburban developments.

Harry B. Warner, of the Maryland Portland Cement Company, has optimistic views on the future cement business in this section. "Though the present market for May and June has been somewhat demoralized," he said, "by reason of cutting and slashing prices, I do not believe that it will be very long before we will have increased business at increased prices. Surely such may be expected within three months and from that time on.

"Security Portland cement is being supplied on a great deal of the important works in Baltimore, particularly the new sewerage improvements and the Forest Park reservoir. Much of it is used on the harbor and other municipal works.

"The company I represent has just closed the contract for furnishing the cement for the new buildings to be erected at the United States Naval Academy at Annapolis. A large contract has recently been completed for the District of Columbia and practically half of the year's output has been sold up to date."

Henry Classen, of the Maryland Lime and Cement Company, said:

"The market conditions in Baltimore are fair and the outlook is encouraging. There is considerable sewer work being done and with the contracts let up to date, practically about one-third of the work has been let. There has been large quantities of Lehigh Portland cement used on the sewer work, also a large amount of the American Sewer Pipe Company's sewer pipe.

"The market here is an open market and dealers are selling at extremely low prices. These conditions are not likely to change, as with the great number of building material firms, competition for the present amount of business must necessarily be keen.

"The break in the Portland cement market, of course, has affected Baltimore, as it is the battle ground for the southern, Maryland and Pennsylvania cements.

"The outlook for the balance of the season is for low prices, with only an ordinary amount of business."

SYRACUSE AND VICINITY.

SYRACUSE, N. Y., May 16.—The Onondaga Litholite Company, builders of cement sidewalks and manufacturers of concrete blocks and stone for building purposes, Henry H. Warner, president, has secured a permit to erect a factory which will cost $15,000. It will be of concrete construction and will be 252 feet long, 62 feet wide and 22 feet high.

The Kennedy Roofing and Paving Company has filed incorporation papers in Syracuse, showing its capital to be $10,000. The directors are Charles E. Kennedy, Edwin T. Kennedy and Helen M. Kennedy.

Contractor John Barr has been awarded a contract for the laying of 27,100 square feet of concrete and cement walk at 9 cents a foot, making a total of $2,439. This is the largest single contract awarded for walks in the city in many years.

The Syracuse Intercepting Sewer Board has awarded Mrs. Blanche Gaffey a contract for the construction of a sewer in Temple Street at $709.30. She was one of eight bidders, another of whom was Mrs. Mary E. Gaffey. The contract calls for 565 feet of eight-inch pipe and 460 feet of six-inch vitrified iron pipe. The highest bid was $1,723.25.

An involuntary petition in bankruptcy has been filed against the New York Brick and Paving Company of Syracuse in Federal Court, and Judge George W. Ray has issued an injunction staying all proceedings of creditors. The order restrains the sale of property levied on under a judgment of $1,320.75, taken by default at Rochester by the Rochester and Pittsburg Coal and Lumber Company. No statement of liabilities was made, but the company has an issue of $50,000 mortgage bonds held by the Trust and Deposit Company, of Onondaga, as trustee, and other liabilities approximating $35,000. The company owns a large brick yard in the western part of the city on the Erie Canal, and about fifty acres of land on the Seneca River near Three Rivers, where clay beds from which the company gets its raw material are located. The clay was brought to Syracuse on canal boats and troubles in construction work on the Oswego Canal interfered with the company's business so that it could make only contingent contracts. The corporation was formed in 1890 with $100,000 capital, which was later increased to $150,000. It manufactures vitrified brick. The petitioners in the bankruptcy case were the First National Bank, the General Flour and Feed Company and the Sedgwick Farm Land Company, with claims aggregating $25,000.

Charles V. Merrick, of Syracuse, representing archi-

tects who made the plans for New York State's $4,000,000 educational building at Albany, has reported to Governor Charles E. Hughes and other state officials that he found several of the concrete foundations hollow, while the specifications called for solid concrete, to be filled in the heavy steel upright columns. R. T. Ford & Co., of Rochester, have the contract. Mr. Merrick said he believed some of the work had been done between 2 and 5 o'clock in the morning. The architect also claims that cement he had condemned was placed in the bags of another manufacturer and used. The Board of Trustees of Public Buildings is investigating. Mr. Ford said: "There is absolutely no foundation for the charges. Merrick had made numerous complaints with reference to the work. Some days ago through the state architect we requested an investigation by the trustees because of Mr. Merrick's action. We now court the fullest investigation."

Six hundred brickmakers are on strike at Kingston, tying up all of the large yards. Because of violence Governor Charles E. Hughes has authorized the sheriff to call upon the National Guard in case the sheriff's force proves inadequate to cope with the rioters. At the yard of the Ulster Brick Company a horse and half a dozen wagons were thrown into the river by a gang of strike sympathizers. Many of the strikers are paroled prisoners from state institutions. Attempts to resume work with non-union men on May 10 were combatted by the strikers and sympathizers. Efforts to have members of the Brick, Tile and Terra Cotta Workers' Alliance to join them have been unsuccessful.

The Benson Mines Company has the foundation nearly completed for the $100,000 plant, known as the Nodulizing process. The contractors, Reeves Bros., of Cleveland, O., expect to have the plant finished by August 1. Instead of shipping the ore in the dust it will be burned into nuggets, making a great saving. The mines have been closed since fall.

Corey & Town have filed a certificate of incorporation to deal in roofing materials, lumber, cement blocks and the like. The capital is $5,000 and the incorporators are Charles F. Corey, James R. Town and Josie S. Corey.

With a string of cars running on a miniature railway around the New York State Fair grounds a person might get the impression that a show was in full swing. Richards & Son, contractors for the new Administration building, have erected the railway to carry sand and cement around the site. One hundred and fifty men are building the forms for the concrete pillars. The contractors have purchased a concrete mixer from the Foote Manufacturing Company at Nunda. The building will contain 3,200 yards of concrete.

The Board of Supervisors of Onondaga County have fixed a price of 25 cents per net ton for crushed stone on board the cars at the Onondaga County penitentiary at Jamesville.

The village of Lyons, N. Y., is allowing a rebate of 2 cents per square foot on the construction of all cement sidewalks, approved by the street commissioner. The city engineer of Syracuse is establishing grades for two miles of cement sidewalks on the Huntley tract, which under a recent act of the Legislature was annexed to the city.

Before Governor Charles E. Hughes had barely signed a bill increasing the limit of compulsory pavement that may be ordered in a city in one year from two to five miles the Common Council of Syracuse took advantage of the new law by ordering the limit.

Plans for the first all-concrete bridge ever built in this city were completed in the office of City Engineer Henry C. Allen at the City Hall yesterday. The structure is to cost $14,000 and will be erected over Onondaga Creek at Tallman Street.

It is to be built forty-seven feet in width, will have a span of sixty feet and will be paved with asphalt.

The funds for the erection of the bridge were provided in the last annual tax budget, and it is expected that bids will be received and a contract let before the end of June. In this event it is expected that it will be completed for traffic before the close of the summer season.

CLEVELAND AND VICINITY.

CLEVELAND, O., May 18.—Cleveland builders and supply men report an active month. Building is in full swing and some big structures are going up. Many others are being planned. Building reports for the first four months of this year indicate a substantial increase over a year ago. The increase over the same period last year is $750,000. For the first ten days in May the total far exceeds the same period a year ago, permits being taken out for $418,000, as against $168,848 for a corresponding period in May, 1908.

One of the best building projects started within the month is a new $125,000 clubhouse for the Cleveland lodge of Elks. The new structure will be erected on Huron Road, near the Wyandotte Hotel, and will be one of the finest clubhouses in the country, being equipped with every luxury and convenience. Ground floor space will be divided into storerooms for rental, the three upper floors and two mezzaine floors being used for the purposes of the lodge. On the second floor will be clubrooms, ladies' parlors, writing, billiard and card rooms and the officers' quarters. The lodgeroom and banquet hall will be on the third floor, with a big ballroom and stage on the fourth floor. Plans have been prepared by Knox & Elliott. Ground will be broken early next month.

A nine-story addition is to be made to the Gillsey Hotel, on East Ninth Street, giving capacity for ninety-one additional rooms and making it one of the most up-to-date and fireproof hotels in Cleveland. The addition will be in the rear and will cost $75,000. Another further addition is planned for next year.

Contracts have been let for the new Longwood School on East Thirty-fifth Street, costing $100,000. The masonry work is being done by the D. C. Griese & Walker Company, the art stone is being supplied by the Cuyahoga Art Stone Company, the slate blackboards by the Cleveland Fireproof Construction Company, and the cement floors by the Carey Construction Company.

Work is well under way on the fine new $200,000 residence for H. M. Hanna on the Lake Shore Boulevard, this city. It will be a brick and stone structure with cement floors. The building was designed by McKim, Meade & White, of New York City, the general contract being held by the Norcross Brothers Company.

Collinwood, a suburb of Cleveland, is to have the finest and safest school in this neighborhood. The building will contain fourteen rooms and will cost about $100,000. It will be two stories in height and the boilers will be in a separate building. The plans for the school have been completed by Architects Searles, Hirsch & Gavin, and work will be proceeded with early in June. A red pressed brick will be used for exterior walls, but the interior will be almost entirely of concrete. There will be separate outside exits from each room. This building replaces the firetrap in which 173 children lost their lives over a year ago.

The Osborn Engineering Company, of Cleveland, is to assist Architects Massiot & Allen, of Columbus, in the reconstruction of the Ohio penitentiary. About $200,000 will be spent at this time for reconstruction purposes. Much of this will be done for sanitary purposes and concrete will be extensively used.

M. M. Munn, a Cleveland engineer, has prepared plans for a concrete grandstand for the West Cuyahoga Fair Association, at Berea, O. The structure will be 50 by 145 feet in size and will be indestructible, according to its designer. Contracts will be let about June 1 so the stand will be ready for the fair in September.

Andrews Brothers, of Cleveland, have been awarded the contract for a new $80,000 public school building at Freemont, O. The building was designed by Searles, Hirsch & Gavin, of Cleveland, and will contain fourteen rooms. It will be fireproof and sanitary throughout.

A twenty-five-suite model apartment house is being built in Cleveland by George P. Geib at Melrose Avenue and East Eighty-second Street. Although containing such a large number of flats, every room will have outside light. There will be a vacuum cleaning outfit in each suite. The building will cost about $50,000. It was designed by Architect J. L. Cameron.

Improvements costing $124,000 are being made at Lakeside Hospital. A new nurses' home is being erected at a cost of $80,000 and other improvements are being made to the main building. The home will accommodate sixty nurses and will have a special hospital ward for them in case they are taken ill.

The Reaugh Construction Company has been awarded the contract for the new Hugbee store on Euclid Avenue at East Thirteenth Street. The building will be four stories high, with a frontage of 150 feet and a depth of 180 feet. It will be of the latest fireproof construction. Abram Garfield is architect.

The Hunkin Brothers Construction Company has secured the contracts for the construction of several fine reinforced concrete buildings for the Goodrich Rubber Company at Akron, O. Three of them will be six-story buildings. The Masons' Supply Company is supplying 20,000 barrels of Superior cement and 20,000 tons of crushed stone from the quarries of the Holran Company for use on this big contract. The same supply company during the past month furnished 1,000 tons of crushed stone for the new Higbee store, 1,400 tons for the Bailey annex on Ontario Street and 16,000 tons of crushed stone for the Corrigan McKinney furnaces in the flats.

The Deckman-Duty Paving Brick Company gave evidences of increased prosperity during the past month when it moved into an elaborate suite of offices in the Electric Building, thereby doubling its office capacity. It is now at 519 Electric Building, in offices formerly occupied by the Carey Construction Company, which has moved to the second floor of the Lennox Building. Mr. Deckman reports an active call for brick. The company is delivering about 3,000,000 pavers for use in Detroit this year and also has orders for the brick needed on six of the county roads and a number of Cleveland streets. The Collinwood plant of the Deckman-Duty Company has been entirely rebuilt this spring, brick buildings replacing the old frames used up to this time. The new buildings will house the machinery, the clay shed, the engine and boiler rooms. A large shop has been built and fitted up with machinery, so repairing can be done on the place. The company is erecting new kilns at its Carrolton plant and contemplates the building of two additional kilns at its Malvern plant some time during the coming summer. One of the late out-of-town orders secured by the Deckman-Duty Company was for 30,000 yards of pavement at Elyria, O.

Andrew Carnegie has donated another $83,000 to the Cleveland Public Library board, which announces that it will use the money for branch libraries, two to cost $30,000 each, and the other about $25,000, exclusive of the sites. Carnegie has been especially generous to Cleveland, having contributed a total of $373,000 for Cleveland branch libraries to date. All are of brick with terra cotta or stone trimmings. The three new buildings will be gone on with this year. Two others are nearing completion, erected from gifts from the same source.

Herman J. Trenkamp, a stove manufacturer, has organized a new stove company to "buck the trust" and is erecting a brick factory building 42 by 225 feet in size. The building will be ready for occupancy by midsummer.

Another interesting concrete bridge is to be built in one of the Cleveland parks. It will serve as an entrance to the new zoo at Brookside and will cost about $12,000, will be 109 feet in length and will have a twenty-six-foot roadway with six-foot sidewalks at each side. The bridge will be erected this summer under the supervision of Park Engineer Zesiger.

The National Concrete Fireproofing Company, a Cleveland concern, has been awarded the contract for the new concrete state hospital for the criminal insane at Lima, O. The building will cost $410,000, and will be one of the first large institutions of its kind to be erected entirely of concrete.

County Engineer A. B. Lea has invented a new combination brick and drain tile to be used at the edges of the county paved brick roads. Work on these roads is progressing rapidly. It is aimed to spend nearly $2,000,000 on this work this season.

Incorporation papers have been secured at Columbus for the Cleveland Concrete Company. H. B. Adell is the chief incorporator.

An amendment to the building code is being considered by the city council to prohibit the erection of church steeples. Following a recent disastrous storm, in which seven people were killed and fifty hurt, and in which several large steeples were blown down, the city authorities drafted the amendment. Another amendment provides that walls of all new buildings must be at least twelve inches in thickness.

E. C. Van Epps, traveling representative of the Cleveland Builders' Supply Company, had his left kneecap injured in an electric car accident at Trombley, O., recently. He narrowly missed being killed. Van Epps is well known throughout the state.

TOLEDO AND VICINITY.

TOLEDO, O., May 18.—The much heralded return of prosperity is not making itself felt very heavily among Toledo builders, and the prospect for an active season is not as good as it was a month ago. Architects are not as busy as they were then and they say that the call for preliminary plans is not as active as it was at that date. The only explanation that can be given for this is that the old law of supply and demand is reigning and as long as Toledo in particular has as many vacant storerooms, offices, residences, flats and factories there can be no active call for new buildings.

In northwestern Ohio, outside of Toledo, the signs are encouraging. Fremont reports quite an active building outlook, the list including a new school building, a new church, a new parsonage, several new business blocks and a number of good grade residences. Sandusky will be fairly active this season, as will be Fostoria, Findlay and Defiance. A number of the smaller places will give attention to new public school buildings. Upper Sandusky will erect a new Masonic Temple, plans for it having been completed by Architects Bacon & Huber, of this city.

Construction work in Toledo is progressing nicely on the new Art Museum and the general contract for the new Nearing Building has just been awarded to A. E. Bentley & Sons Company, this firm having had the contract for the foundations.

Of the larger concrete contracts which are to come up this summer, the most important will be for a new concrete bridge across the Maumee River. This structure is planned to take the place of the present Cherry Street bridge, which was erected considerably more than two decades ago and which is much too small to take care of the traffic. The erection of a bridge first came up several years ago, when bonds were issued, but the matter found its way into the courts, where it has remained ever since, it only recently having been settled so that work could go ahead. Bids are being asked for and contracts will be awarded some time in July. Over half a million dollars is available for the project, but it is estimated that the cost of the structure will exceed this amount, as the bridge is the main connection between the eastern and western parts of the city, and in addition to caring for the local city street cars, it also takes care of a half dozen interurban lines which run hourly cars, in addition to freight and limited cars.

Street paving will receive considerable attention in Toledo this summer, contracts for several streets having already been awarded and at its recent meeting the city council authorized a bond issue of $100,000 to take care of others which were not provided for earlier in the season. According to present plans, all the streets provided for in this latest budget are to be paved with brick.

Andrew Maher, one of the veteran contractors of the city, died during the past week at the home of his daughter on Willow Avenue. For some years past he was an inspector for the city.

Incorporation papers have just been issued to W. L. Loy and F. J. Pogue, of Findlay, who will erect a new stone crushing plant at Piqua. These two gentlemen are at present owners of similar plants at Findlay and at Carey, and the new plant is intended to assist in filling orders which tax the capacity of the present plants. About sixty acres of land along the Miami River has been purchased and work on the new plant has already been started.

The Toledo Aerie, Fraternal Order of Eagles, has just incorporated for the purpose of erecting a large temple on Erie Street, near the present Masonic Temple, the Elks' Temple and the National Union Building. Building plans are being prepared by Architects Langdon & Hohly, of this city.

The board of education has progressed so far with the plans for its two new high school buildings as to be able to announce that one will probably be of red shale brick and the other of brown shale brick. A portion of the roofs will be covered with tile and in construction both buildings are to be of concrete.

For the purpose of expediting construction, the city has been divided into four parts by the board of public service and contracts for laying sidewalks will be awarded by district instead of at large, as before. Contracts have already been signed and the city will lay a much larger number of square feet of sidewalks than ever before. This increase has been brought about by property owners who have shown a disposition to have the city do the work, as it is done under a guarantee and at a cost slightly below what the average person can secure.

Otto Ausburg, vice-president of the Ohio Builders' Supply Company, is offering his stock in the company for sale. He is desirous of leaving Toledo to look after business interests elsewhere.

Casper Siek, general contractor, has the contract to erect a large furniture factory for the Kobacker Furniture Company at Flint, Mich.

The General Electric Company, which a number of years ago established a subsidiary factory in this city, has just announced its intention of erecting a large additional factory building in this city at a total cost of upwards of $200,000. Some delay has been occasioned by reason of the projected building being located on one of the city's streets. The city, however, has vacated the street and construction work will be started as soon as contracts can be awarded.

The Realty and Construction Company has removed its offices from the Ohio building to the Colonnade building. The concern does a general contracting business.

The Toledo Builders' Exchange has resumed its plan of holding bi-monthly stag smokers in its club rooms. By this means it is intended to stimulate attendance at the rooms during the busy summer months. Plans will shortly be formulated for the annual outing of the exchange, which is usually held some time in July or August.

Work on the new baseball park for the Toledo American Association team is rapidly nearing completion under the direction of Schillinger Brothers, general contractors. The structure, including both grand stand and fence surrounding the grounds, are of steel and concrete.

The county commissioners have arranged to do considerable stone road work this season, the first contracts having just been awarded to James Sheehan for the repair of two stretches of road. Wood county has also awarded several contracts and are now advertising others. Fulton county is arranging to spend a much larger sum than usual for this kind of improvement and Sandusky county is also planning to follow suit along this line. The local automobile club, joined in the project by other automobilists of this section of the state, are active in urging the building of stone roads as rapidly as possible.

C. Edwards Holden, manufacturer of fire and facing brick at Mineral City, O., called on Toledo brick dealers and supply men last week. While here he renewed his acquaintance with Gen. Isaac R. Sherwood, congressional representative from this district, a close friend and schoolmate during his younger years. Mr. Holden is over eighty years of age, but gives his business his personal attention and spends a considerable portion of his time on the road as salesman for his products.

Efforts of local brick manufacturers to make a stiff mud brick have not proven as successful as anticipated, and for the most part their manufacture has been discontinued.

Richard Kind, secretary of the Toledo Builders' Supply Company, has been elected delegate to the national Elks' reunion, and in addition to attending the meetings of this body will spend some time traveling through the West.

BUFFALO AND VICINITY.

BUFFALO, N. Y., May 18.—Various contractors, including those who use a great quantity of cement, are now very busy in Buffalo and vicinity, weather conditions this spring being favorable for their work. The barge canal contracts at this end of New York State are attracting especial attention. For instance the United Engineering Company, which has a $2,000,000 canal contract between Lockport, N. Y., and Pendleton, N. Y., announce that before June 1 they will have 2,000 men at work on that section. Plans are also being considered for the deepening of Niagara River from Tonawanda, N. Y., to a point designated as Gill Creek that lake vessels may be able to dock within the city limits of Niagara Falls. The estimated cost of the work is $400,000. An idea of the vast amount of barge canal improvements in progress throughout New York State is given in the recent official announcement that 198 miles of the waterway are now under contract, at an aggregate cost of $36,478,438.

Reinforced concrete will be used in additions to be built to the factory of the Pierce-Arrow Motor Car Company, of Buffalo.

The Collescue Cement Company, of this city, will build a temporary office in Katherine Street.

Donald Fraser has been laying some concrete walks for residents of Port Colborne, Ont.

The Canadian Portland Cement Company recently shipped from Port Colborne, Ont., to Fort William, Ont., 11,000 barrels of cement to be distributed from there to points in Manitoba, Alberta and Saskatchewan.

Concrete will be used in the Cosgrove manufacturing plant to be erected in Lestershire, N. Y. N. I. Mather, architect, of Binghamton, N. Y., has prepared plans for the building.

G. W. Bushnell, a contractor of Elmira, N. Y., is building a number of concrete walks in that city.

A number of concrete sidewalks and crosswalks will be built this year at Mansfield, Pa.

The German Rock Asphalt and Cement Company was among the recent bidders for paving contracts in Buffalo.

Representatives of the Marengo Portland Cement Company recently visited Caledonia, N. Y., to plan for the opening of a big cement plant in that village.

G. G. Shortreed, of Barrie, Ont., has sold the Raven's Lake Cement Works, a Canadian plant, and another concern to the Scarboro Securities, a Canadian concern, for about $500,000.

The local trade has been greatly amused by the announcement that John P. Brady, a contractor and builder, has had erected at his country home, near Gardenville, not far from Baltimore, a concrete monument in memory of Adam, the first man. The memorial is in the form of a plain square shaft, surmounted by a sun dial. The monument bears this inscription: "This, The First Shaft in America, Is Dedicated to Adam, The First Man."

The Canadian Pacific and Grand Trunk Railroads recently considered plans for the construction of viaducts in Toronto, Can., at a cost of more than $4,000,000.

William V. N. Barlow, who for years was a prominent architect and contractor, is dead at his home in Albion, N. Y. He built the Orleans County, New York, Courthouse and other buildings at Albion.

B. I. Crooker was low bidder for the construction of the new pumping station in this city at a cost of $383,921.

Schumacher & Moyer, of Niagara Falls, have the contract to build a $40,000 addition to the Rogers plant in that city.

Esenwein & Johnson, Buffalo architects, have prepared plans to build a new six-story business block for Sinclair & Rooney, of this city, at a cost of $140,000. Metz Brothers, of Buffalo, will have the general contract.

Several Buffalo architects are working on plans for the proposed $4,000,000 City Hall for San Francisco.

The Blake Contracting Company has been organized in Buffalo with a capital of $100,000.

ST. LOUIS.

ST. LOUIS, Mo., May 15.—An encouraging feature is the ease with which funds can be procured from the banks for all legitimate purposes, particularly on real estate collateral.

The city of St. Louis municipal budget carries $6,832,000 annual appropriation for expenses for the current fiscal year. It will be readily seen what the disbursement of this large sum means, through the work it furnishes and for which it pays a good deal to the wage-earning class. Another favorable factor is that forty miles of new track will be laid by the United Railways in the streets of the city this year. The reconstruction will cost at least $30,000 a mile, or a total of $1,200,000, and will give steady employment throughout the season to 1,500 laborers.

While some people during the past year or so have been complaining of depression in business, building has been going on without interruption, except from weather conditions, particularly residences. In case of small houses, they have continued to appear on lots where land is cheap, beyond the city limits, so fast it does not exaggerate the results of five years of this building to say that these neat but cheaply built homes seem to sprout like mushrooms. A large percentage of these houses are brick and concrete, for which material St. Louis is peculiarly well favored. In spite of this, rents are nearly as high as ever, and consequently there will be a continuance of the building boom.

The United States Geological Survey Structural Materials Testing Laboratory is to be located in the old power house at Thirteenth and Locust Streets, and the removal of the equipment from Forest Park has been started. The plant is considered of vital importance to the business interests of St. Louis on account of the big Panama trade that has been developed here by reason of the central location of the city and the fact that a testing plant is established here. Since the government established a Panama purchasing agent here last year, an immense volume of materials for use in constructing the canal has been shipped to the isthmus from St. Louis. It is now the assembling point for these materials, and as all these have to be tested as to their quality and durability before being accepted, the testing plant has been of great service in getting the trade. These materials include wood, stone, steel, wire, rope, etc.

Missouri has 800 miles of macadam roads, and of this 130 miles were constructed in 1908, according to Curtis Hill, state highway engineer. More than 300 miles of gravel roads were built last year, making 4,600 miles in all. During the year $1,658,200 was expended, of which 5.4 per cent was donated. Mr. Hill says the state is more interested in road work than ever before.

The southwest corner of Waterman and Belt Avenues is to be improved with an apartment house to cost about $100,000. It will be four stories high and cover the entire lot.

St. Mark's handsome $125,000 parochial school, plans for which have just been completed by Architects Baker & Knell, will be one of the best equipped and most unique school buildings in the city. A large swimming pool, with a fine gymnasium, are included in the plans for the building, which is to be located at Academy and Minerva Streets. The building will be three stories above the basement. The latter will be finished, making it practically a four-story structure. Gothic style of architecture will prevail and the materials used in construction will be gray brick with red tile roof. The structure will be 93x163 feet.

The United States government is to establish an army supply depot at St. Louis, and will erect a warehouse of its own. More than $200,000 will be expended in the establishment of the station, including purchase of land and for the building.

The largest sewer in the world is in course of construction at North St. Louis. It is to be several miles long and will be the main artery of the city's sewer system for the drainage of its northern section. It will cost $1,500,000. For more than a mile this mammoth aqueduct will be thirty-four feet in diameter. Work has been in progress for three years and it will require seven more to complete it. It is being constructed of armored concrete.

The Tyrol Investment Company has completed plans for the erection of a handsome building at the corner of Etzel and Belt Avenues, to be known as the Tyrol Apartments. It will be three stories high. The exterior of the building will be in the German Renaissance. All of the entrances will be from a central court, laid out as a sunken garden, with a fountain fed from an artesian well. The structure will cost about $125,000. Clymer & Drischler are the architects and will superintend the construction.

The Glencoe Lime and Cement Company report a steady increase of business and find their centrally located downtown offices a convenience, both to themselves and their customers.

Among the interesting features of the new quarters of the Acme Cement Plaster Company is a cabinet of drawers, each of which contains a map of a state. The various towns in the several states where the company's plaster is carried in stock are designated by pins with bright colored heads, so that at a glance one can see how many customers they have in the different sections of the country and what kind of plaster they sell.

EAST ST. LOUIS

Bids for the new outlet sewer were opened yesterday by the Board of Public Improvements. The result will be made public next Monday. The estimated cost is $743,000. There are nine bidders for the work, as follows: Geisel Construction Company, St. Louis; Metropolitan Construction Company, Boston; Federal Improvement Company, Chicago; O. T. Dunlap, Edwardsville, Ill.; Joseph J. Duffy, Chicago; Fruin-Colnon Construction Company, St. Louis; Nash & Noble, Chicago; Sullivan & Sons, and McCarthy Bros., Cincinnati, and Walter Coonan, East St. Louis. City Engineer W. J. Crocken states that several of these bids were well within the estimated cost. As soon as this matter is disposed of the city will push forward the work of paving streets, etc.

KANSAS CITY AND SOUTHWEST.

KANSAS CITY, MO., May 18.—Prospects could hardly be better in the building field than at the present time in this section of the country, the April building permits in this city amounting to $1,553,990, and the permits for the present month will also be large. This total represented the value of some 480 buildings, so it will be seen that no large buildings were included. The building this year is of a very general character, and the prospects are good for a continuance of this same varied assortment of building. Contractors are figuring very closely, and this may have something to do with the amount of building, but it is said to not be making much money for the contractors. The material men are generally behaving themselves, however, and are making their regular profits in nearly every instance.

The secretary of the Board of Public Works has just figured up the total of the public improvement contracts let by that body since April 18, 1908, the aggregate being $882,151.42. Since September 4 the board has let 180 contracts under the new charter, with a value of $400,000.

The first day of May did not bring any building trade strikes to mar the prospects, and it is expected now that there will be nothing from that quarter to handicap the contractors. Material still seems to be plentiful enough, with the exception of brick, and the price of brick has advanced to $8.50 per thousand, delivered on the job, for the common variety. It is stated, however, that a little more advance and there will be almost an unlimited stock to draw from, as a little advance from this point will make a slight permium to offer to the outside plants for their product. All local brick plants are turning out all the brick they possibly can, and the shipments from Kansas points are still very heavy.

According to reports coming in from Kansas that state bids fair to break all previous crop records this year, and Missouri, Oklahoma and Nebraska are also making a good showing. In fact the only part of the Kansas City territory where conditions are not about right is part of Western Texas, where there has been a considerable drouth. With another good grain year this section of the country will never halt in its building operations, for this is primarily a grain country. That is the reason it goes right ahead while business is slack in manufacturing sections.

The boat line project seems to be hanging fire for some reason, and the public beginning to wonder what is the matter. A great deal of talk has been indulged in, and it was said that the million dollars would be raised in a week or so, but a month or two has slipped by and the outside public is not getting any information as to progress, and is consequently losing interest. There is no question but what the boat line will be a big thing for this city and the people living here and in the tributary territory, but the line must be established, and the money raised to establish it, before it can be of benefit. Walter S. Dickey, of the W. S. Dickey Clay Manufacturing Company, is at the head of the movement, and seems to be making a sort of a dark lantern campaign for both money and guarantees of freight.

Some idea of the value of the recent tests carried on in this city to test the value of finely ground cement, as compared with the coarser product, can be obtained by a careful perusal of the following excerpt from the specification for a concrete viaduct to be built on Lydia Avenue, Kansas City, Mo., for the Chicago and Alton Railway Company, the Missouri Pacific Railway Company and the Metropolitan Street Railway Company, after the tests had been made to the satisfaction of the engineers in charge: "In case the cement used in the work shall be ground to a fineness exceeding the standard specifications by more than two per cent through the 200 mesh screen, the contractor may reduce the amount of cement per cubic yard of concrete by three per cent of the above qauntities for each decrease of two per cent in the residue retained on the 200 mesh sieve."

The Roll Coal and Lime Company reports that it is doing twice the business this year in cement that it had in 1908. It still continues to handle the same brand, the Dewey, and finds that it is giving splendid satisfaction.

A. H. Craney, vice-president of the Kansas City Portland Cement Company, is up from St. Louis to pay a visit to the main office this week, and brings the information with him that his company has landed the contract for 10,000 barrels of cement to be used in the Mid Continent Hotel, in this city, and that construction work is to begin immediately. Mr. Craney is hoping that the boat line will be established without delay, as his plant is located on the Missouri River at what in early days was known as Wayne Landing, which is one of the best natural landings on the entire river, and the only good one within twenty miles of this city.

H. Noreross, Colorado representative of the United Kansas Portland Cement Company, with headquarters in Denver, has been paying the main office in this city a visit during the past week.

Cement plants are reporting a good lot of orders and steady shipments at this time, and the prices are said to be firmly maintained.

The St. Benedict College, which is to be built immediately in Atchison, Kan., will make use of 6,000 barrels of the Kansas City Portland Cement Company's product.

Manager Stewart, of the Kansas City office of the Marblehead Lime Company, reports that the orders for lime are increasing every day, and that the use of hydrated lime continues to grow, in spite of the fact that such a small proportion of the dealers even have learned the full use to which this product can be put.

The twelve-story Gloyd Building, which is to be made of reinforced concrete, is now putting in the foundations, and will make use of 6,000 barrels of Kansas City Portland cement. Something is being done in the excavation for this building, which seems likely to cause trouble later. The concrete has been placed in parts of the excavation, and still blasting is allowed in other parts of the same excavation. Some concrete men are inclined to think that this will damage the set of the cement and weaken the foundation.

The Ash Grove Portland Cement Company has the contract for furnishing some 5,000 barrels of its cement for use in building the new court house in Springfield, Mo. Construction work is about to begin.

The Kansas City Portland Cement Company has closed up a contract to furnish 10,000 barrels of cement to the Government to be used in enlarging the Federal prison in Leavenworth, Kan.

Word comes from Wichita, Kan., that there is fully $2,500,000 worth of public and private building to be done there this year, and that skilled labor is very short, fully 300 mechanics being needed to carry on the work properly, in addition to those on the ground.

Twenty-one apartment houses, which are to be built by the Hotel Investment Company on Broadway between Thirty-fifth and Thirty-sixth Streets, are to cost a total of $175,000. Each apartment, when completed, will consist of eight rooms and two baths.

The Kansas City Portland Cement Company has just installed its second 1,400 kilowat turbine engine, and the stone in the quarry is being handled by a Marion steam shovel instead of by the old, slower and more expensive method.

The South Sixth Street viaduct in St. Joseph, Mo., is to be rebuilt, the city and street railway company dividing the expense. Creosoted timbers, paving blocks, etc., are to be used.

The Engineering and Construction Company, of Webb City, Mo., has been awarded the contract to construct a sewer system for Washington, Kan., at a cost of $23,750.

Edward Hely has already begun preparation of the site for a rock crushing plant in Cape Girardeau, Mo., with a daily capacity of 1,000 yards. The machinery is to cost $35,000, and the plant is to be ready for operation by August 1.

The Missouri Paving Company has been incorporated in St. Joseph, Mo., by J. R. Backliffe, E. R. Gibson and G. A. Knowles.

It is reported that fourteen miles of concrete sidewalk is to be laid in Russellville, Ark., within the next few months.

Word comes from Paris, Tex., that contracts are soon to be let for several miles of street paving. Bitulithic paving and Bois D'arc blocks on a five-inch foundation are favored.

Work is about to begin on the new warehouse of the Bowersock Milling Company in Lawrence, Kan., and it will be three stories high and fireproof construction.

The Port Arthur Planing Mill Company, which has been incorporated in Port Arthur, Tex., with a capital stock of $20,000, will not only operate a planing mill, but will handle slate and other builders' supplies.

The contract for repairing the Federal building in Leavenworth, Kan., has been let to the Kansas City Tile and Slate Roof Company, of this city.

At a meeting of the stockholders of the Southwestern Portland Cement Company, held in El Paso, Tex., the following officers and directors were elected: Carl Leonardt, president; Felix Martinez, C. Buchter and C. V. Merrill, vice-presidents; O. J. Binford, secretary; J. McNary, of El Paso, treasurer. The directors are C. A. Canfield, Edw. L. Doheney, J. S. Schirm, Aman Moore and Jas. D. Schuyler, of Los Angeles, Cal.; Whitney Newton, Denver, Col.; P. A. Reardon, Flagstaff, Ariz.; W. J. Mills, Las Cruces, N. M.; A. Courchesne and J. M. Raynolds, of El Paso, Tex.

Moorhead Wright, of this city, contemplates the erection, at an early date, of an $18,000 residence, the walls of which are to be made of hollow tile, plastered on the outside with a gray-colored cement. The mantels are to be imported from Italy and the roof will be made of Spanish tile.

X. O. Pindall has begun the erection of a $7,000 frame building at Twentieth and Arch Street, which is designed to have a stucco exterior.

Word comes from Iola, Kan., that the Prairie Portland Cement and Ceramics Company, which was organized by Dr. O. Gerlach, has been financed and that the plant will be located near Nowata, Okla.

The Urban Construction Company has been awarded the contract for erection of a five-story office and business building for Langston Bacon, to be erected at 1020-22 Walnut.

The Automobile Club, of Kansas City, will build a club house on the Grandview Road, twelve miles south of this city, to be completed in September. W. C. Whitcomb is chairman of the building committee.

The Seguin Vitrified Paving and Face Brick Company, has been incorporated in Seguin, Tex., with a capital stock of $75,000, and will take over the plant of the Lone Star Brick Company, improve it, and add a vitrified brick plant. O. G. Pearson is president, R. L. Wupperman is secretary and C. E. Tips is treasurer.

W. P. Chapman is about to engage in the manufacture of cement bricks in Siloam Springs, Ark.

Missouri has 800 miles of macadam roads and twenty miles were constructed in 1908. More than 300 miles of gravel roads were built that year.

The Columbus Brick Company has been incorporated in Columbus, Neb., with a capital stock of $50,000, by Myron D. Karr, Julius S. Nichols and others.

J. D. Bramhall, a brick manufacturer of Cincinnati, is about to establish a brick plant in Durant, Okla.

A Kansas City company proposes to establish a plant in Pittsburg, Kan., for the manufacture of asphalt paving blocks, the product being a combination of asphalt and Joplin gravel. Peter Hansen is the Pittsburg representative.

The Corby estate in St. Joseph, Mo., has let the contract for the erection of a twelve-story office building, to be 80x114 feet and to cost about half a million dollars. The building will be made of steel and concrete and will be strictly fireproof.

The asphalt paving companies seem to be acting a little queer just at this time. They have served notice on the Board of Public Works that they can no longer comply with the requirements to furnish a ten-year guarantee bond, and still they are bidding for contracts right along, where such a bond is required. They also want to furnish bonds signed by individuals instead of a surety company, as in the past.

The refusal of bonding companies to guarantee asphalt paving contracts for a period of ten years was the reason assigned by the Board of Public Works last week for ordering Prospect Avenue between Twenty-ninth Street and Swope Parkway paved with oil macadam. Some other streets are also to be paved with the same material.

A concrete bridge is to be built over Brush Creek, in this city, at a cost of about $7,000. The plans call for a thirty-six-foot roadway and seven-foot sidewalk on each side. The bridge will be on Prospect Avenue.

The Midland Motor Car Company will erect a building at 1523-25 Grand Avenue, to be constructed of brick, stone and cement, and to be three stories and basement and cost $30,000.

J. G. Murphy is having plans prepared for a reinforced concrete factory building 50x103, to be built at 2012-14 McGee Street, and to cost about $20,000.

Harvey Stiver, of the Postal Building, this city, has received the contract for the new general passenger station for the Atchison, Topeka and Santa Fe Railroad Company in Bartlesville, Okla.

LOUISVILLE.

LOUISVILLE, KY., May 15.—The situation, from the standpoint of builders, contractors and building supply men, is good. It is not yet active, but there are enough actual contracts being let, and prospects of definite description are numerous enough, to encourage every line connected with building. Cement is in good demand, the sewers having proved a lifesaver for a dull period, the reaction from which, however, seems to be on. In the building line the Walnut Street Theater, the Children's Free Hospital, the Tyler Hotel Building, the new Christian Church, the new building of the Standard Club, a new office building for the water company, and a new structure for the Business Woman's Club are among the possibilities. Last month's building report showed that there were 366 permits taken out, as compared with 340 for April, 1908, and that the expenditure represented was $275,000, an increase of 10 per cent.

The allied trades are having no fault to find with the situation. Those who make a specialty of roofing say that business is showing signs of life, and the handlers of asphalt are finding plenty to do. Fire brick is in fair demand, and the sewer pipe and tile manufacturers indicate a satisfactory condition of business. Even with conditions as they are, however, the general opinion is that things have only begun to liven up, and that the next month or so will see even more of an awakening.

Henry Gray, of J. B. Speed & Co., said that the situation has not opened up much yet, but that there is a good deal doing. The sewer work is consuming a large part of the cement produced by the company, and the plant at Speeds, Ind., is runing full capacity. Several big cement jobs are in prospect, two of which are the coagulant basin of the water company, and the underpass to be built by the city at Ninth and Oak Streets. The water plant will be a 12,000,000-gallon proposition, and will cost more than $150,000. It will form an important link in the filtration system. The water will flow from the reservoir into the coagulant basin, where all the sediment and foreign matter will be allowed to settle before the water is run through the filtration beds. It will not be necessary, however, to wait for the completion of the coagulant basin before putting the filter plant in operation. Bids on the basin will be received June 1. Bids on the underpass, which will be constructed almost entirely of reinforced concrete, will be opened by the Board of Public Works May 24. The estimated cost is $110,000. The underpass is to eliminate a dangerous grade at the Louisville and Nashville crossing, and the railroad will pay half the cost.

The Kosmos Portland Cement Company has put its selling department into active operation again, and C. M. Timmons is keeping things moving up on the sixth floor of the Paul Jones Building. He said that the demand has been very good since the Kosmos product was put on the market again, and said that several large orders have been landed. Among them was one of several thousand barrels for a dam across the Kentucky River at Frankfort.

The Louisville Sewerage Commission is keeping the manufacturers of cement interested watching the letting of contracts for the work. Several have been let in the past month. C. T. McCracken & Co., of Columbus, O., will construct the Vernon Avenue sewer, and the Henry Bickel Company, Louisville, will construct section A of the middlefork sewer. They were $30,000 and $50,000 contracts, respectively. Contracts have also been let for the Oak Street sewer, the Bismarck Avenue sewer, and the tube on Broadway.

The sewer construction work was enlivened by a cave-in at Eighteenth and Stratton, where the Weber Construction Company is working on the Southern outfall. It was caused by a heavy storm. The trench collapsed for fifty yards, burying engines and other equipment along it. A water main was broken by the cave-in, and so the trench was flooded, too.

Franklin, Ky., is to have a real sewerage system, according to reports received here. The Newman Constructing Company, of Evansville, Ind., has secured the contract and it will cost $14,630.68. Fourteen bids were submitted.

Speed's cement exclusively went into the construction of the big elevated wash water tank at the filter plant of the Louisville Water Company. Henry Bickel was the contractor. The tank was built of concrete throughout and is 100 feet high. It has an underground basin and an underground conduit connecting it with the filters. It will be used to furnish water for cleaning the filters themselves. The underground basin is fifty feet in diameter and thirteen feet deep. The elevated tank is the largest piece of concrete work done here in a long time. It is supported on nine concrete posts, and in the center is a hollow concrete column connecting it with the underground basin. The elevated tank is of about the same size as is the underground basin. It will hold 150,000 gallons of water. The scheme for the washing of the filters was originated by engineers of the Board of Water Works, and has been pronounced by other engineers to be both simple and effective.

Judge Wilson, at Bedford, Ind., appointed E. W. Shirk, president of the United States Cement Company, receiver for the company. The company has 120,000 barrels of cement on hand and values its assets at $105,000. Its mortgages and bonds amount to $500,000 and there are outstanding $130,000 in notes and accounts. Slow sale of cement is the cause given for the failure.

The National Concrete Construction Company, according to Jake Ohligschlager, is a busy institution just now. It has just been awarded the contract for the concrete work on the Catholic church and rectory at Richmond, Ind. The ceilings, floors and roof will all be of that construction. A saw mill at Rayville, La., is also to be built of concrete, and the National got the job. This was done because the rate of insurance on the ordinary type of mill is almost prohibitive. With a fireproof mill, however, the owners will discard insurance. The National has finished its work in Evansville, where it completed the Furniture Exchange and the Evansville Packing Company buildings to the satisfaction of everybody concerned.

The Central Concrete Construction Company reported that business was good and that prospects were excellent. A rather interesting bit of work it is doing is some ornamental balustrades on top of the porch of J. H. Caperton's handsome country home, Ria Vista. There is a good deal of foundation and paving work being done, and hardly any brick paving is being arranged for now at all, granitoid having come in so rapidly.

Vice-President Streicher, of the National Roofing and Supply Company, said that the force is being rushed to take care of the contracts now in hand, and that the outlook is fine. There is a good deal of new work being figured on in addition. Roofing is active just now, several big jobs in that line having been handled. These include overhauling the roofs of the plants of the Bannon Sewer Pipe Company and the Kentucky Vitrified Brick Company.

The Bannon people reported that business was a little better than heretofore reported, and that things are picking up both locally and out of town. The company has bought the old stock yards at Thirteenth and Delaware, and is using it as a storage place for tile just now. It may ultimately be used in case the plant is extended.

The Southern Roofing and Paving Company representatives said that a general line of business is being done, and that the situation is good. Several big cement jobs out of the city are being figured on. Prospects look fine.

Wall plaster is going unusually well, according to the Atlas Wall Plaster Company. All the suburbs are using up a lot of it, indicating that the boom in suburban residences is having its effect. Hercules wall plaster is rated as the best seller of the company's line. Things are much better than last year.

Business at the plant of the Kentucky Wall Plaster Company was reported to be good. Everything was moving along nicely, and the plant was operating at full capacity.

Though the normal demand hasn't developed yet, the situation was regarded as satisfactory by the people at the Ohio River Sand Company's office. The big new boat recently put to work is doing well, and a new digger has just been installed. Both it and the old one are in operation, so that the amount of sand turned out will be much larger than usual. The new digger was constructed in Marietta, O., though the machinery was installed here. The Henry Vogt Machine Company installed the boilers.

Burrell & Walker reported the situation as very dull. It was said that there was no immediate prospect of things improving.

President Krahn, of the Louisville Fire Brick Company, said that inquiries are being made freely and orders are coming in fair volume, but that the demand was still not as active as it used to be. The plant has been practically rebuilt since the fire several months ago, and will be ready to operate at a normal capacity next week, though with the situation as it is it is not expected that this will be done.

S. F. Troxell reported that things have been slowing up a little, but that business is still good. He is figuring on a lot of out of town work. In the roofing line he will put a gravel roof on the new garage of the Oldsmobile Company on Fourth Avenue. He is doing some concrete work on the residence of Edward Hart, at Anchorage. Prospects are good.

The Walnut Street Theater, a new amusement enterprise, is to be built on Walnut Street just west of the Seelbach Hotel at a cost of $75,000. Memphis people are interested in it. McDonald & Dodd are the architects for the building, which will be of fireproof construction, and largely built of reinforced concrete.

The Builders' Exchange has started a campaign for new members. Joseph Ingram, the roofing and asphalt contractor, is a member of the committee appointed for that purpose.

NASHVILLE AND THE SOUTHWEST.

NASHVILLE, TENN., May 17.—Although concrete block construction will be light this summer, it is due more to the notions of property owners than to anything else, for the concrete manufacturers are having about all they can do to take care of the general demand. Of course sidewalk construction is the heaviest single class of construction just now, but a number of buildings are under way with that material and many of the industrial plants are using cement extensively for various structures. Cement prices are remaining steady and will not likely advance for some time.

The Nashville Concrete Company is now putting out a clean white concrete block that is something new in this section. W. M. McDonald, engineer in charge of the construction operations of the company, has proven his theory on white concrete and is making quite a success of the venture.

A new contracting and engineering company has been formed by J. D. Foy and R. L. Proctor. The company will be especially fitted to do high-class work. Mr. Foy came to Nashville more than a year ago from Atlanta, Ga., to build the concrete approaches and piers for the Jefferson Street bridge. This work is of great magnitude and no small undertaking for a man as young as Mr. Foy, who is only 27 years of age. He is a graduate of the Alabama Polytechnic Institute and Cornell University. Mr. Proctor has been in business here for eleven years and has established a reputation as a man of business ability and integrity. He came to Nashville in 1898, a member of the engineering corps of the Louisville & Nashville Terminal Company, and was engaged in the building of the Union Station. He was the manager of the Nashville Roofing and Paving Company for some time and did much important work. The new company will have its offices in the Stahlmann Building.

The Southern Construction Company, of Harriman, Tenn., has been incorporated with $50,000 capital stock by W. H. Grannis and others. The company will manufacture concrete blocks.

Hale & Bitting, 425 James Building, Chattanooga, Tenn., will increase the capacity of their rock-crushing plant at Chattanooga.

With approximately fifteen miles of concrete sidewalks to be laid this summer by the city of Nashville, and about ten miles by private property owners, Nashville will, no doubt, get in the lead of southern cities for modern walks. The first bids called for 26,675½ linear feet, or approximately five miles. These walks are to vary in width from five to ten feet, averaging about seven and one-half feet, making a total of 202,562 feet of concrete used in this construction. A number of contracts are to follow.

W. I. Cherry, president and general manager of the United Paving Company, of Atlantic City, N. J., has been in Nashville recently. This is his old home. The United Paving Company was given the largest paving contract ever given any one firm in America. This was the contract to pave Atlantic Avenue in Atlantic City. The avenue is three and one-half miles in length and seventy feet in width. The material used covered 156,000 square yards of paving and is exactly like the bithulithic paving used on Broadway in Nashville.

The Elks' lodge at Nashville will build a reinforced concrete addition to their clubhouse here. This addition will cost about $30,000.

The Nashville Bridge Company has recently completed a six-story reinforced concrete building for its own office use near the Cumberland river here.

Rock Crushing Plant Has Disastrous Fire.

Fire, destroying the rock-crushing plant of the Georgia Railway and Electric Company, Atlanta, Ga., February 10, put a stop to all construction work of this company, temporarily. The loss is estimated at $10,000.

MEMPHIS AND THE SOUTHWEST.

MEMPHIS, TENN., May 17.—Building this spring in Memphis is good. Real estate is again being firmly held and transfers that are made are made at advanced prices. Prices are cut rather closely on building materials at Memphis, but a feeling of optimism for the season pervades the Memphis firms.

W. W. Fischer, of the Fischer Lime and Cement Company, Adams Avenue, said: "Our business is very good in all lines. Our business in the country is better than some time ago. There is quite a bit of work going on in the small towns. Cement prices are about steady; they are down to the lowest notch." The Fischer Lime and Cement Company is about to start work on a new warehouse in East End. The firm reports an unusually good business on plaster. They handle the United States Gypsum Company's and the American Cement Plaster Company's plaster. The Fischer Lime and Cement Company has been furnishing some of the material for the Scottish Rite Cathedral here and for the Reichman-Crosby warehouse.

The American Snuff Company has built a six-story building in North Memphis. It is reinforced concrete and the work on the same was done by the Ferro-Concrete Company, of Cincinnati.

J.). Lovelace, general manager of the John A. Denie & Son Company, Front Street, said to ROCK PRODUCTS' representative this week: "Business has exceeded our expectations this year; while not so good as year before last, it is better than last year. Every month's trade this year has exceeded its predecessor. We are extending and developing our business right along and have some good contracts ahead. We are handling Acme plaster and Laclede firebrick. We have received the biggest part of the city contract on sewer pipe. Our firm has the exclusive agency here for St. Genevieve lime. We are exclusive agents here for the Sibley-Menzie Brick Company's (Birmingham) face brick. Our own lime kilns in Alabama are now in full operation."

The Kavanaugh Sand Company, Tennessee Trust Building, said: "The sand trade is holding up well. Prices remain unchanged, all the city yards are busy. Spring building is steadily increasing."

E. A. Fraser, of the Cubbins Lime and Cement Company, in Northeast Memphis, when asked about market conditions, said: "The market is in very good condition. There is a considerable amount of building going on. We are handling Atlas brand of cement and the Royal and the United States Gypsum's Ivory cement plaster, of which we are the exclusive agents. We have lately received the contract for curb, gutter and sidewalks at Oxford, Miss. We also furnished the material recently on the Webb & Maury warehouse and the Choctaw elevator here."

W. P. Chapman, at Siloam Springs, Ark., will construct a plant for the manufacture of cement bricks.

THE WEST COAST.

SAN FRANCISCO, CAL., May 8.—The record of building permits issued in San Francisco during April is hardly as good as that for March, the total being $2,827,054, as compared with $3,141,958, but this slight decrease is causing no discouragement among the dealers in building materials, who believe that a distinct revival will come later in the summer. The Oakland record shows a marked improvement, and activities in the north coast section are going ahead with a rush, the Portland, Ore., record for April being greater than anything in the history of that city, while the month's activities in Seattle, Wash., have seldom been surpassed.

The building permits in San Francisco, however, give but little indication of the amount of concrete work being done, as the largest requirements at present are for the new harbor contracts, fire protection cisterns, sewer and street work. San Francisco's reinforced concrete sewer system, lined throughout with vitrified brick, will be among the finest in the world, and several large contracts for this work have been let this month. The improvement of the streets is progressing rapidly, and the downtown merchants have come forward with an offer to supply funds not provided for by the bond issues. Contracts have also been placed for a number of new cisterns for the fire protection system.

From every point of view all indications point to a big year for the California cement manufacturers. The production has increased greatly in the last few months, but the demand has more than kept pace with it, and the situation has caused an advance in price of 5 cents per barrel, the price now being $1.95 per barrel for carload lots in bulk, f. o. b. San Francisco. The same advance has gone into effect at many interior points, and in the northern states. Stocks of foreign cement have been greatly reduced in the North, and the supply here is about exhausted, the few lots remaining being offered at very low prices. Some will, of course, be brought to the North during the summer and fall by the annual grain fleet, but the importers find difficulty in disposing of this stock in advance.

All the local plants are now working at their maximum capacity, and the output is fully sold up. The Santa Cruz Portland Cement Company, which increased its equipment during the winter, is now working all the time to improve its process with a view to securing a greater output and economy of manufacture. The new Mount Diablo plant of the Cowell Portland Cement Company is now shipping in large quantities, and the output will be gradually increased during the summer. The city of Los Angeles is putting in a small plant of its own for the completion of the Owens River water project. A number of large contracts from the northern cities have been taken by local firms and heavy shipments are now being made up the coast.

The state harbor commissioners have awarded the contract for pier 36 to the Associated Contracting Company, and have employed Smith, Emery & Company to test all cement used in the work.

The Santa Cruz Portland Cement Company has secured the contract for furnishing the harbor commissioners with cement for the next twenty months, the contract calling for between 60,000 and 100,000 barrels. The contract was let at the full quotation then prevailing, or $1.90 per barrel. In addition to the concrete work, the two sections of seawall on which bids will be received June 10 will require 117,000 tons of rock.

The Pacific Portland Cement Company has bought 320 acres of land adjoining its property near Suisun, Cal., containing a large deposit of lime rock. The company now has 960 acres of lime rock in that vicinity.

The Southern Pacific has instructed Agent R. R. Countiss, of the Transcontinental Freight Bureau, to advance the rate for building or paving cement and for building plaster and lime, including hydrated lime, from the East to southern California terminals to 55 cents per hundred pounds. The advance has been at the solicitation of local interests, who claimed that the small lots shipped in from the East were used merely to hold down the price.

The Western Sand and Rock Company has been incorporated in San Francisco with a capital stock of $25,000, by R. J. White, J. W. Henderson, W. W. Allen, F. A. Denison and H. F. Peart.

F. S. King, of San Francisco, as trustee for eastern capitalists, has taken over the gypsum holdings of the Death Valley Chemical Company for a consideration of $200,000. He states that the purchasing syndicate will erect a $1,000,000 plant, including a railroad connecting the properties with the Tonopah & Tidewater Railroad.

The Plaster Block Company has been incorporated in San Francisco with a capital stock of $25,000, by H. S. Wheeler, J. F. Makowski, N. E. Kinney, S. W. Backus and M. E. Delano.

The Vulcan Rock Company is making extensive improvements in its plant near Suisun, Cal., installing additional crushers and more than doubling the size of its bunkers.

The city of Oakland has decided to install an asphalt paving plant, similar to the one operated by the city of San Francisco.

The Mt. Shasta Volcanic Hollow Tile and Cement Company has been incorporated at Yreka, Cal., with a capital stock of $1,000,000, by Abner Weed, E. L. Williams, W. E. Tebbe, George A. Tebbe and R. S. Taylor. The company will manufacture cement, cement tile and building blocks, and the plant will be erected on the lime deposits near Grass Lake, owned by Abner Weed.

James Brown, a contractor of Prince Rupert, B. C., is in Seattle, Wash., to arrange for extensive shipments of cement for the new town.

The Keystone Sand Company has been incorporated at Redwood City, Cal., with a capital stock of $25,000, by H. W. Postlethwaite and F. R. Turton, of the Holmes Lime Company; P. W. Rochester, G. W. James and C. A. Rochester.

The Arrowhead Portland Cement Company has been incorporated at San Bernardino, Cal., by Los Angeles and San Francisco parties, with headquarters at Etiwanda, Cal. The company will develop a large cement deposit north of that town, and has secured a right of way for a 12-mile railroad connecting the site with the Santa Fe.

The West Coast Portland Cement Company, of Lewiston, Idaho, is building a 100-ton steamer to handle its cement shipments from the upper Snake River deposits.

One of the largest recent contracts for imported cement is for the new Guggenheim smelter at Tacoma, Wash.

The Inland Empire Portland Cement Company has been incorporated at Spokane, Wash., by H. C. Trexler, E. M. Young and D. E. Ritter, of Allentown, Pa.; F. A. Blackwell, of Spirit Lake, Idaho, and L. P. Larsen, of Metaline, Wash. The capital stock is $1,000,000.

The Mound House Plaster Company, manufacturer of Regan hard wall plaster, has entered the field for a share of the San Francisco trade.

The town of Mill Valley, Cal., is in the market for a large amount of crushed rock and cement for sewer and bridge work.

Large shipments of clay are being sent from the Santa Fe clay beds, near Corona, Cal., to the California Portland Cement Company at Colton, Cal.

W. C. Griffin is putting in considerable new machinery at his lime quarry near Sonora, Cal.

The San Diego Cement Pipe Company has taken a large contract for pipe for the Mutual Water Company, of Escondido, Cal.

The quarries of the California City Rock Company were disposed of at a sheriff's sale on April 28, to satisfy claims of the First Federal Trust Company, of San Francisco, for $217,842.

The San Francisco Lime Company has been incorporated in San Francisco with a capital stock of $50,000, by E. A. Kiethley, W. C. Reveal, E. H. Horton and H. F. Bassett.

The R. F. Thompson Estate, of Portland, Ore., is making arrangements to build two reinforced concrete block buildings at a cost of about $400,000.

The Raton Cement Block and Brick Company, of Raton, N. M., has purchased a $50,000 plant from the C. W. Raymond Company, of Dayton, O.

Gray Brothers, of this city, are now putting out a special brick, intended to compete with concrete for foundation work. The brick is twice the standard thickness, which is said to reduce the labor cost by about half. Concrete has formerly been used almost exclusively for foundations in San Francisco, but quite a lot of the new brick have been sold in the last month.

The Vallejo Brick and Tile Company, Consolidated, of Vallejo, Cal., is now making deliveries of paving brick on a contract for pier 40 in this city. This is about the first job of paving brick laid in San Francisco, but it is believed that more work of a similar nature will come up in the near future.

There has been a general discussion for the last few weeks over alleged defects in the new concrete building of the Agnews Insane Asylum. The complaints were made by the officers of the Building Trades Council, but so far tests have failed to show any defective work. The disturbance seems to be entirely spite work on the part of the labor men, owing to the fact that W. Engstrom, the contractor on the job, adheres to the open shop principle.

Leonard Schiller, a local cement contractor, was accidentally asphyxiated recently at his home on Haight Street.

The Board of Supervisors of Napa, Cal., have had a large rock crusher on trial for several months and have decided to purchase it.

E. P. Vandercook and Whitman Symmes have sold to Rudolph Spreckles 800 acres of lime rock lands, one of the best deposits in the country, including water and rights of way near the line of the Ocean Shore Railroad in Santa Cruz County.

A concrete building is to be erected shortly for the Pythian Castle at West Berkeley, Cal.

The supervisors of Ventura County, California, have decided to build a new concrete jail.

Several of the bidders on the $2,000,000 Government drydocks at Pearl Harbor, T. H., have just passed through San Francisco en route for Washington. Considerable difficulty is expected in building these docks, as the coral bottom is likely to contain fissures, from which water flows with considerable force.

To Save Papers From Fire.

An immense concrete fireproof building, the first of its kind ever provided for a railroad, is to be erected by the Pennsylvania Lines West, probably in the Pittsburg district, to be used for the storage of reports, deeds and other important papers. Another may be located in Philadelphia.

Every year hundreds of railroad buildings in the United States are destroyed by fire, and in many instances papers of value are burned. Often such papers are stored in division buildings that are of wood and there is always danger of their destruction by fire.

Concrete Block Factory.

ROSENBERG, TEX., April 20.—Rosenberg continues to progress and the latest new enterprise is the erection of an up-to-date concrete plant for the erection of houses of concrete blocks. The very latest invention in concrete machinery is to be used. The Rosenberg Concrete Company is headed by K. Hillyer, of this city, who, together with his associates, has already purchased machinery.

CONCRETE ENGINEERING

Meeting of American Society for Testing Materials.

The twelfth annual meeting of the American Society for Testing Materials will be held at the Hotel Traymore at Atlantic City, N. J., on Tuesday to Saturday, inclusive, June 29 to July 3, 1909. Secretary Edgar Marburg, of the University of Pennsylvania, announces that the coming meeting is to have a program of great significance to the future of structural material.

American Society of Engineering Contractors.

On April 14 and 15, meetings were held at the United Engineering Society Building in New York, at which the permanent organization of the American Society of Engineering Contractors was effected. This new national society begins its career with a membership of nearly fifteen hundred.

A constitution was adopted at the meeting on April 15, and officers and directors were elected. "The object of the Society is the advancement of engineering knowledge and contracting practice; the maintenance of a high professional standard among its members and the elimination of those practices and abuses that now exist in the engineering and contracting business, and to strengthen the bond that should exist between engineers and contractors."

Corporate members must be engineers, contractors or manufacturers of engineering materials, or equipment, that have been engaged in these lines for at least seven years; a degree from a college or university of standing counting as two years' experience. The constitution also provides for associate members.

Officers for the first year were elected as follows: George W. Jaekson, of Chicago, president; Halbert P. Gillette, of New York, first vice-president; Daniel E. Baxter, of New York, second vice-president, and Daniel J. Hauer, of New York, temporary secretary. These officers, with the following gentlemen, will make up the board of directors: De Witt V. Moore, of Indianapolis; Edward Wegmann, of New York, and W. D. Lockwood, of New York, to serve one year; E. S. Hanson, of Chicago, George Warren, of Boston, and J. R. Wemlinger, of New York, to serve two years; and Major Cassius F. Gillette, of Philadelphia, F. C. Hitchcock, of New York, and Howard J. Cole, of Morristown, N. J., to serve three years.

The society will begin its monthly meetings in the fall. It is already assured of a large membership of eminent engineers and contractors, and sufficient funds to carry on its work. Applications for membership can be made to the temporary secretary at his office, 721 Park Row Building, New York.

Fire Resistive Properties of Various Building Materials.

The United States Geological Survey has undertaken to make a series of comprehensive tests for the purpose of determining the fire-resistive properties and rates of heat conductivity of various building materials and the comparative efficiency of different methods of fireproofing, the investigations having the further object of lessening the liability of loss by fire in government buildings and reducing their cost through more efficient methods of construction.

As a preliminary part of this series, tests of thirty panels constructed of various building materials were made by the survey at the Underwriters' Laboratories, Chicago, to determine the effect of fire and subsequent quenching with water on mortar building blocks made of river and slag sands; common, hydraulic-pressed, and sand-lime brick; gravel, cinder, limestone and granite concrete; glazed building and partition terra-cotta tile, and limestone, sandstone, granite and marble building stone. The mortar building blocks and the concrete were made in the structural materials testing laboratories of the survey; the other materials, except some of the common brick, were obtained in the open market at Chicago, Ill.

The materials were subjected to the direct application of heat for five hours and were then, except in five panels, immediately quenched with water. Wherever possible tests were made to determine the compressive strength of the materials after this treatment. Temperatures were observed at intervals, and the behavior of the materials during the test and the condition of their surfaces before and after the heating and quenching were noted. Photographs of the panels were taken to show the effect of the tests.

The tests of the different materials were carried on under conditions as nearly identical as possible, but there was some unavoidable variation in the conditions. The furnace was in almost constant use by the Underwriters' Laboratories, and it was necessary to arrange the tests so as not to interfere with the regular work of those laboratories. It was also necessary to make half of the tests in winter and the other half in summer, and many of the building blocks used in the first tests were subjected to freezing weather just prior to testing. The results of the tests are presented in a report by Richard L. Humphrey, which the Geological Survey has just published as Bulletin 370. Although the tests were conducted primarily for the purpose of obtaining information essential to the government, it is believed that the results will prove to be of much importance to the general public. Heretofore fire tests of building materials have been made at random, and scarcely any two tests have been comparable. The results of the survey tests are not critically analyzed in the bulletin, although a few of the more important features are pointed out. They are presented merely as preliminary data regarding the relative fire-resistive qualities of the building materials tested.

Philadelphia Engineers.

PHILADELPHIA, PA., May 12.—The Engineers' Club of Philadelphia, 1317 Spruce street, held a business meeting on April 17, President W. P. Dallett in the chair. Ninety members and visitors were present.

The secretary announced the resignations of August A. Miller, E. P. Coles and Lewis F. Moody. A report of the committee on rules on the proposed revision of the by-laws was presented, a copy of which laws was to be sent to each member.

Benjamin Franklin, active member, presented the paper of the evening, entitled "Interurban Railways," which was discussed by several of the members.

A meeting was held on May 1, President Dallet presiding, and 125 members and visitors in attendance.

The president announced the death of William P. Henszey, an active member since May 17, 1884, which occured on March 23.

The following members were elected: Jacob Lynford Beaver and Henry L. McMillan to active membership; Edward Morris Basset and Malcolm Roderick Maclean to junior membership, and Thomas Gray Phinny to associate membership.

Francis D. West, visitor, presented a paper on "The Sanitary Control of Filter Plants," which was discussed by some of the members present. Upon motion a vote of thanks was extended to Mr. West.

Evening Reception for Ladies.

On the evening of April 30 the Engineers' Club of Philadelphia tendered a reception to the wives, sisters and sweethearts of the members at their beautiful clubhouse, 1317 Spruce street, which was an exclusive and most enjoyable affair, as no pains were spared by the committee to make this, their first complimentary effort, a distinct success.

The decorations were lavish and exquisite in selection. The handsome onyx mantles were heaped with fragrant blooms, which the mirrors reflected to the eye's enchantment, while in the parlors and hallway, and along the stairway leading to the billiard and audience rooms, was a riotous profusion of palms and ferns and winding greenery. A wall of potted plants across the front of the dancing room completely hid Professor Harry Cook's orchestra, which discoursed sweet strains throughout the evening. There was much friendly and social intercourse, many pleasant acquaintances made and generally a very enjoyable participation in the amenities afforded by a masculine club's entertainment. After refreshments, consisting of various delicacies, the dancing began, which continued until the wee small hours. All pronounced the evening a huge success and expressed a hope of many repetitions.

George T. Gwilliam was selected chairman of the reception committee. This veteran of the club, and for many years its treasurer, but who is now located in New York City, came over for a few hours for the occasion, and as in every function at which he is called upon to preside he proved the right man in the right place. C. S. Redding, the popular manager of the club, indulging in the slang vernacular, was on the job all the time, and his beaming countenance testified to the satisfaction he felt as to the success of the committees who had charge of the affair.

The names of those to whom credit is due for the success of the reception:

Sub-Committees for Ladies' Reception.

Executive—W. P. Dallett, chairman; H. W. Spangler, George T. Gwilliam, H. E. Ehlers, A. C. Wood, William M. Laverty, Thomas C. McBride, Charles Day, H. DeH. Bright, C. S. Redding, Charles H. Cox, H. E. Snyder.

Reception—W. P. Dallett, chairman; James Christie, R. G. Develin, Washington Devereaux, William Easby, Jr., H. E. Ehlers, Henry Hess, Edward S. Hutchinson, Charles F. Mebus, Henry H. Quimby, Philip L. Spalding, W. P. Taylor, W. S. Twining, St. G. H. Cooke, Kern Dodge, S. E. Fairchild, Jr., David Halstead, Harrison Latta, Charles S. Schaffer, H. W. Spangler, P. H. Wilson.

Finance—George T. Gwilliam, chairman; H. E. Ehlers, treasurer; H. M. Chance, H. E. Havens, E. J. Kerrick, Thomas L. Latta, R. W. Lesley, W. W. Umbenhauer, William Vollmer.

Decorations—A. C. Wood, chairman; Gordon Brandes, L. S. Bruner, John A. Carlisle, Charles H. Cox, William M. Laverty, Charles M. Mills, M. R. Pugh, Joseph C. Wagner, F. K. Worley.

Entertainment—Thomas C. McBride, chairman; John M. Boers, L. S. Bruner, E. J. Dauner, Charles Day, F. H. Gilpin, Karl Nibecker, Charles S. Redding.

Invitations—H. DeH. Bright, chairman; Charles H. Cox, James F. Haldeman, John J. Horridge, E. E. Krauss, H. Livingston, H. E. Snyder, George B. Taylor.

Junior Dance—Charles H. Cox, chairman; J. S. Bradford, L. S. Bruner, Karl Nibecker, C. S. Redding, Thomas E. Rodman, Frank H. Rogers, H. E. Snyder, Barclay White.

THAT PEORIA BRIDGE.

Failure to Reach Bed-rock Responsible for Destruction to Concrete Structure.

PEORIA, ILL., May 15.—On the second day of this month at 6 o'clock in the morning the concrete wagon bridge, completed but a bare three weeks, slowly sank in the river.

The two piers beyond the draw span toppled suddenly and noiselessly from their foundations and, carrying three arches of steel and concrete with them, slid into the waters of the Illinois River and sank almost entirely from sight. The pier beyond the draw was the first to give way, sinking towards the draw span. The sinking of this pier dragged the next one with its connecting arch with it, and this in turn dragged the second and third arches down to the water twenty feet below.

The plans and specifications set forth that the piers which sank were to have been built on piling sunk six feet below the bed of the river, there being 110 piling under each one of the piers which gave way. These piers had been built on the piling without any regard as to whether rock bottom had been touched or not. Consequently the weight of hundreds of tons had slowly but surely crushed down its frail support. Investigations have proven that the concrete structure itself was perfect and merely the fact that no care was taken to place the bridge on a rock foundation caused the destruction of this structure, valued at $100,000, the loss of which will, in all probability, fall upon the city.

Awarded Contracts.

The Turner Construction Company, Broadway, New York City, has the contract for the reinforced concrete skeleton framework and floors for a factory building 75'x57', five stories and basement, for William Hughes at Metropolitan Avenue, near Wythe Avenue, Brooklyn, N. Y. This building will have brick walls. Work will be undertaken at once. Th. Engelhardt is the architect.

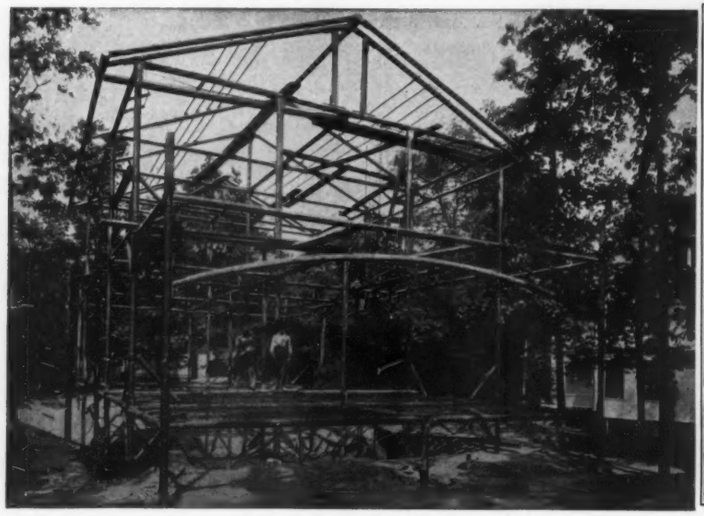
They also have the contract for all the reinforced concrete area walls, vault walls, court walls, stairs and passageway roof, in connection with the Hotel Ritz-Carlton and Carlton House, at Madison Avenue and Forty-third Street, New York City. M. Reid, general contractor; Warren & Wetmoore, architects. Work will be undertaken at once.

They have also been awarded the contract for the construction of a reinforced concrete roof and monitors for the new one-story factory building for the United Piece Dye Works, at Lodi, N. J. This building is 266'x205'. Work will be undertaken at once. Approximate value of reinforced concrete work, $40,000.

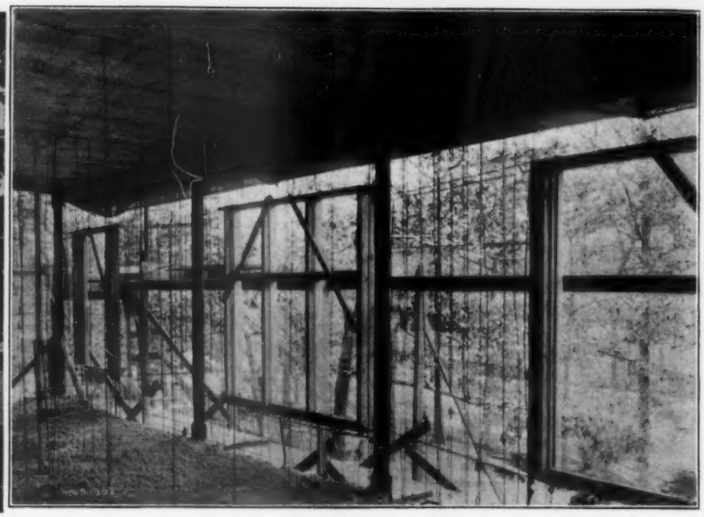
The same company also has the contract, on a percentage basis, for the erection of a cold storage warehouse, reinforced concrete throughout, 138'x54', seven stories and basement, at Elmira, N. Y., for the Hygeia Refrigerating Company. Work will be undertaken at once.

Importers to Erect Warehouse.

The Strohmeyer & Arpe Company, importers, will erect a ten story 54'x100' fireproof warehouse at 139 Franklin Street, New York City. The architects are Maynicke & Franke. The general contract has been awarded to Chas. H. Peckworth.



SKELETON OF STEEL TUBING.



METHOD OF HANGING SASH FOR WINDOW OPENINGS.

Suspension Wire Concrete Construction.

(Continued from page 3.)

A floor slab fourteen feet square between supports and only three inches thick was loaded six hundred pounds to the square foot and showed practically no deflection. Another slab was loaded until it deflected several inches, and when the load was removed the slab went back to its original position; the slab was then loaded until the girders were bent and the slab was deflected in the center more than eighteen inches. This load was left on for several days, when the supports were cut and the slab was allowed to fall to the ground, a distance of about four feet. The load was then removed and the slab was examined carefully, but it was found that no cracks of any kind had developed and that the concrete was in a perfect condition.

The first building in which this construction has been used has just been completed in Glencoe, Ill., at the corner of Sheridan Road and Center Street. M. J. Morehouse, 2117 Fisher Building, Chicago, was the architect of this residence, and the construction was carried out by G. A. E. Kohler, of Kohler Brothers, Fisher Building, Chicago. This residence is elaborately finished and every possible feature of construction is here demonstrated. The accompanying cuts show the residence in the different stages of its completion. It contains eight rooms, with a large reception hall and bathroom. It is 28′ 6″ wide and 56′ 5″ deep, two stories with basement and attic.

Detailed Description of the Method Used.

A complete skeleton of steel tubing is first erected, all the pipe being cut to length and drilled in the shop. The columns extend down to the basement floor and rest on concrete piers, which are the only foundation required. None of the pipes are threaded, but are put together with a special malleable fitting, which is bolted through the column and girder. A number of different fittings have been devised and patented, but in the construction of this entire building only one type of fitting was used, showing how simple it will be to carry a large stock of fittings on hand, and thus avoid delays in making special parts for different connections. The fitting used was an angle cast in malleable iron, concave on the side next to the pipe. These fittings are bolted onto the girders in the shop and the girders are then poured full of concrete, and after the frame has been erected the columns are poured full of concrete, so that all bolts are cemented in position and the interior of the pipe is protected against corrosion.

A frame of this kind can be set up with common labor, and in a remarkably short time, as the only work is to hoist the pipe into position and bolt it together. The strength of the pipe is greatly increased by being filled with concrete, and in the construction of this building it was found that the frame was so rigid that no bracing was required.

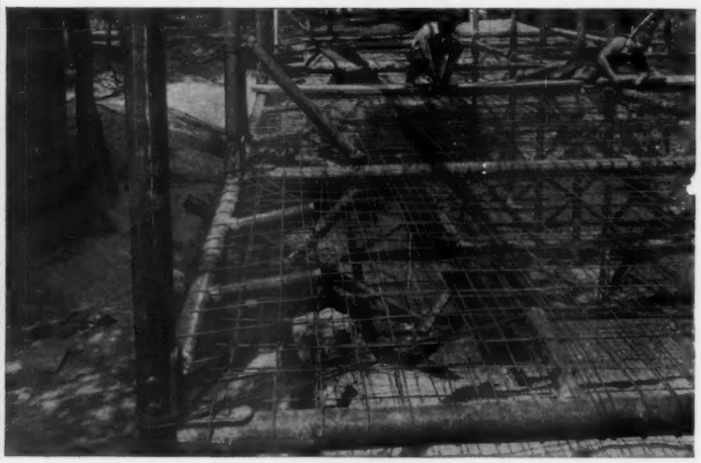
A system of diagonal bracing for all corners was intended, but was never put in and the frame was so rigid when completed that no vibration was perceptible even before the wire or concrete had been applied.

After the framework is completed a system of horizontal trusses are constructed around the outside of the building on a level with the floors, which forms an incompressible framework on which to draw the floor wires. These trusses are constructed by wrapping the wire around the columns and driving in short pieces of pipe for strutts. This method of trussing is very strong and easily applied, and if it is desired to tighten or loosen one of the trusses it is done by striking the pipe strutt with a sledge hammer, thus the frame can be easily adjusted even after the floor wires are in position. The same method of trussing is used under the girders where especially heavy loads occur, and any desired strength can be obtained by using a sufficient number of wires.

After the truss wires are in place wire is drawn around the girders in both directions, either the entire length of the structure or in such sections as desired, and these wires are attached end to end with a specially devised and patented coupler. This process gives a continuous wire stretched around the girders, drawn under a tension of nearly 1,000 pounds and left free to adjust itself as the strain is applied. For this purpose No. 0 to No. 3 wire is used wound as close as required for the strength of the floor. The side walls are wound in the same manner, and the window frames are attached to the wires with the same couplers used for joining the floor wires. The walls of each story are wound separately, so that it is impossible for a girder to deflect, as each girder hangs from the girder above, and is supported its entire length. Expanded metal or wire cloth is stretched under the top wires of the floor, and is tied to these wires with specially designed clips; this wire cloth acts only as a medium to hold the concrete until it has hardened. The wires at this stage of the construction are very stiff and the floor can be walked on, and for wheeling the concrete only a single plank is required. The concrete is then dumped or shoveled on and leveled off to an even surface. As the fresh concrete is thrown on to the expanded metal the weight deflects the floor wires, and as they are wound continuous they slip over the girders and draw the under wires to a high tension. In this manner before the concrete hardens each wire is drawn to its full tension, and each wire in the floor is under precisely the same strain. When the concrete sets each of the upper wires are thoroughly covered with concrete and the under wires carrying the ceiling are perfectly straight.

Expanded metal or wire cloth is then applied to the under wires and the plaster is put on the ceiling in the usual way. Floors are constructed in this man-

PLACING THE CONCRETE ON THE FLOOR.



HORIZONTAL TRUSS SYSTEM.

ner spanning from fourteen to sixteen feet between supports and the thickness of the concrete is not over three inches.

If wood finish floors are desired strips may be bedded in the concrete and the wood floors nailed to these strips. The outside walls are formed by applying wire cloth to the vertical wires as above mentioned, and the plaster is then put on the same as in any other form of cement plaster finish. Where hollow inside partitions are used they are formed similar to the outside walls, but if desired solid partitions can be constructed with this method, which are only one to one and one-half inches in thickness. Where partitions are to run a horizontal wire is stretched in the floor before the concrete is put on and vertical wires are suspended from this wire about ten inches on centers. After the concrete has been put on the upper floor these wires are attached to the wires in the lower floor, so that when the concrete is put on this floor the weight of the floor stretches the partition wires; wire cloth is then attached to these vertical wires and the partition is plastered in the usual way. The roof is constructed in the same manner as the floors and the finished cement surface is left exposed, colored as desired. The roof of this residence is finished with a float finish, has stood throughout the entire winter and spring and no leaks have developed. It has been universally understood that concrete roofs could not be constructed and made water tight unless they were covered with some roofing material, but in this construction the natural concrete roof has been proven to be thoroughly practical.

This residence is complete with plumbing, hot water heating and electric wiring and no difficulty was encountered in the installation of any of these branches.

With the exception of interior trim, no wood was used in the construction of this residence, as all exterior mouldings and ornaments are formed of cement, cast on the ground and wired in place before the plastering was done.

Universal Portland cement was used exclusively in this building. The concrete for the floors was composed of one part cement, three parts lake sand and five parts gravel; the roof was composed of the same concrete, on which was placed a ¾-inch covering of mortar composed of one part cement, three parts sand and finished with a wooden trowel. The walls, inside and outside, and the partitions were covered with Portland cement plaster; the outer walls were given two coats of plaster composed of one part Universal Portland cement (1 bag), three parts of sand (3 cu. ft.), hair to the amount of ½ bushel per barrel cement was mixed with the sand. The exterior was finished with a pebble-dash composed of one part cement and two and one-half parts coarse sand and gravel which passed a ⅜-inch screen and was retained on a ¼-inch screen.

A New Concrete Test.

In a paper read recently before the Society of Engineers, Dr. J. S. Owens, A. M. Inst. C. E., described the origin and application of a new test for determining the end of the mixing process in preparing concrete. The methods which have been tried in the past to achieve this result were described, three such being referred to: (1) Inspection; (2) making briquets, breaking when set, and noting if of uniform strength; and (3) mixing pigment with the concrete, making briquets, breaking when set, and examining fracture for even distribution of pigment. The author criticized these methods, and showed their lack of value for the purpose. He stated that it had been ascertained experimentally that inspection alone could not detect the difference between concrete having one part of cement to two of ballast, and that having one to three. The following definition of properly mixed concrete was then given: "Concrete in which the various ingredients are as uniformly distributed as the size of the particles composing them will admit." He went on to say: "The question, therefore, is how to determine when this uniformity of distribution has been attained." The principle on which the author's test is based was thus described: "If we take a few small samples from different parts of the heap of concrete, and if we can tell in some simple way whether all the samples contain the same relative proportions of stone, sand and cement, we have a means of telling whether the concrete is properly mixed or not." The author's method of comparing the samples is simply to place each in a tall glass cylinder nearly filled with water, shake them up, and allow them to settle. The rate of settlement of the cement in water was shown to be about thirty times as slow as that of the sand, which, in turn, was slower than that of the larger particles of stone; this caused the stone, sand and cement to settle on the bottom in distinct layers. It was shown that the depth of these layers was proportional to the amount of the material present in the sample, and that in this way it was possible to tell whether each sample had the same amount of cement, sand and stone.

Concrete Beam Test.

In Bulletin No. 28, issued by the Engineering Experiment Station of the University of Illinois, Prof. Arthur N. Talbot describes some unique, practical tests on large floor slabs for use in the Grand Crossing track elevation of the Illinois Central Railroad. This is perhaps one of the most important reinforced-concrete constructions of the kind yet undertaken, and it gave an opportunity for making field tests to determine the strength of larger pieces of concrete made under practical conditions. The beams weighed 33 tons apiece, probably the largest reinforced-concrete beams ever tested, and the testing apparatus used and the method of making the tests involved some novel features. The beams carried loads of 840,000 lbs. The tests determined the effectiveness of two methods of placing reinforcement to resist shear failure. The results will be of interest also because the beams were chosen almost at random from a large number of beams made up for use in a railroad structure. There has been a feeling among engineers that test beams made up in laboratories differ so much in make-up from the work found in reinforced-concrete construction that the results of laboratory tests may not be considered to be applicable to actual construction. The tests, however, indicate that the action and properties of reinforced-concrete beams made under careful supervision under the ordinary conditions of construction do not differ much from those of laboratory test beams. Owl Portland cement was used.

A Reinforced Concrete Hotel in Texas.

The Plaza is the name of a new hotel and resort nearing completion at Port Arthur, Tex. This hostelry was promoted by John W. Gates, of New York, and is one of the finest hotels on the Gulf. It will cost complete $100,000. It is entirely of reinforced concrete, plain round bars used.

It is 190 feet wide and has a depth of 150 feet, consisting of three stories and basement. The foundation is 36 inches below grade and rests on a 12″x48″ concrete slab. The basement walls are 22″ trick. The walls of the first story are 18′ high and 17″ thick. The second floor walls are 12″ thick and the third floor walls are 8″ thick.

THE RECHRISTENED PLAZA HOTEL AT PORT ARTHUR, TEXAS. CONCRETE CONSTRUCTION THROUGHOUT.

The floors are laid of concrete slabs 6″ thick.

In mixing the concrete a Smith mixer was used and the concrete was placed at the rate of forty to eighty yards per day. The concrete aggregate was composed of Kansas City Portland cement, a poor grade of beach sand, clean but very fine and smooth, and medium clam shells, which are rather soft. The aggregate for the floor slabs, walls, etc., were mixed in proportions of 1—3½—4. In the columns the aggregate used was 1½—2—4.

In pouring the concrete from four to twelve feet was dumped into the forms and well spaded. The forms were allowed to stand ten days and the centering was not removed for two or three weeks.

The results were very satisfactory, and the walls free from imperfections and faults.

The building contains eighty guest rooms. The lobby, dining room, kitchen and Dutch room are large in proportion for handling excursionists.

The architect who designed the building is C. A. Logan, of Port Arthur. H. D. Applegate & Son, of Beaumont, Tex., are the general contractors, and the materials were supplied by the W. E. Hall Lumber Company, of Port Arthur.

The building was started in October, 1908, and is now all enclosed and plastered. The owners expect to have it open for business in June.

LOS ANGELES, CAL., May 1.—Glazed granite brick, manufactured by the Southern California Brick Company in accordance with a process adopted recently, will be used in the construction of a bungalow for Peter J. Fink at Ocean Park.

The plans were prepared by the Milwaukee Building Company, which also will erect the residence. The cost will be about $6,000.

THOMAS A. EDISON

Sets at Rest Certain Erroneous Impressions Caused by a Misquoted Interview in a Daily Paper.

So much has been written and said about Thomas A. Edison's inventions that the public at large is ready to believe almost anything. The greatest living inventor of the age has been often misquoted in regard to the poured concrete house, one of the many inventions which he has been working on for some time.

Mr. Edison is a millionaire as everyone knows, so the concrete house which he has invented will be put forward not with the idea of making money out of the invention, but for the sole purpose of providing for the workingman a fireproof, sanitary, durable home for the least money.

The *Orange (N. J.) Advocate* publishes the following authentic story with the sanction of Mr. Edison:

Thomas A. Edison has for some months been working upon a pet scheme which is now about completed, the object of which is not to put money in his own pocket, but to give to the world, particularly to the families of workingmen, homes that will enable them to live within the income of the poorest paid mechanic or clerk and at the same time enjoy all the privacy and improvements that hitherto have been only the privilege of those more fortunate in the possession of incomes.

Mr. Edison has not been infected with the library endowment bug, but he is imbued with the practical idea of doing something for the elevation of his fellow being by putting within their reach habitations that will embody every essential of a comfortable, airy, substantial, even beautiful home, segregated from the crowded, unhealthful, uncomfortable tenements to which they are now by restricted means compelled to resort.

Technical publications have already made allusions in an incomplete way to this subject, but it is the privilege of The Advocate to present the first complete, authentic description of the plans and details of what is at the moment Mr. Edison's favorite project.

The purpose of the inventor is to furnish a sanitary home to families at present living in congested tenement districts, at such a price that rent, plus car fare, does not exceed, say, $9 per month.

Mr. Edison's first idea was a two-family house, designs of which were made by a New York architect, and considerable work was done on the patterns for the moulds. The idea was abandoned because, first, the design was impracticable, and offered serious obstacles; second, there is a growing demand for single houses. The new model house is designed by Messrs. George E. Small and Henry J. Harms, Jr., the engineers engaged by Mr. Edison to design the moulds, make the necessary experiments, etc. A house built of stone, according to this design, would cost between $20,000 and $30,000 and would require repairs regularly.

The house is for one family, with a floor plan 25x30 feet, intended to be built on lots 40x60 feet. The front porch extends 8 feet and the back stoop 3 feet. On the first floor is a large front room 14x23x9.5 feet high, intended as a living room, and a kitchen in the back 14x20x9.5 feet high. In the corner of the front room is a wide staircase leading to the second floor. This contains two large bedrooms, a wide hall and a roomy bathroom (7′ 6″x7′ 6″x8′ 2″ high). The third floor has two large rooms. Each room has large windows, so that there is an abundance of light and fresh air. The cellar, 7′ 6″ high, extends under the whole house and will contain the boiler, wash tubs and coal bunker. The main room, as well as the outside of the house, will be richly decorated. The decorations will be cast with the house and will, therefore, be a part of the structure and not stuck on, as is done at the present time.

The house will be entirely of reinforced concrete, including roof, floors, bath and laundry tubs. The doors and window frames will be the only parts of wood or metal, so it will be practically fireproof. It is, furthermore, water-proof and vermin-proof. The inside walls will be concrete also (no plaster finish). The surface, obtained by the special mixture used for the process, is perfectly smooth and can be tinted or painted if desired.

Mr. Edison thinks that the cost of this house will be about $1,200, ready for occupancy, including heating and plumbing. He has emphasized more than once that this price is not for isolated houses, but for houses built in large quantities, as in whole blocks, and in such a locality that the material (sand and gravel) from the excavations can be used. To break the monotony of a row of houses, the designs will be varied to some extent.

Cast iron moulds will be used, which will be set up on a concrete foundation. This foundation (footing) and the cellar floor (of concrete also) will be built some time before actual building commences, to allow it to harden thoroughly. It should be understood that with foundation is not meant the cellar walls, as in an ordinary frame house, but merely a base or footing, upon which the moulds are to be erected. A complete set of moulds will cost approximately $25,000, while the necessary plant will cost aprpoximately $15,000 more. It will be necessary, for successful operation, to work with at least six sets of moulds, to keep the men and the machinery going.

Mr. Edison thinks it will be possible to erect the moulds for a house in four days, fill the moulds with the liquid concrete in six hours, and dismantle in about four days more. Allowing six days between for hardening of the concrete, will give fourteen days for a house, and in this way he figures that 144 houses can be built in one year, with the six sets of moulds. The forms being used indefinitely, reduces the cost of forms or moulds to a minimum. At the present time, with the use of wood for forms or moulds, this is the principal item in building which makes concrete for dwellings prohibitive.

After the moulds have been erected, the pouring or contruction of the concrete house begins. Extra large size mixers will be used, dumping the concrete in tanks, from which it will be conveyed to a distributing tank on top of the house. A large number of pipes or open

troughs lead the emulsion to various openings in the roof, from whence it flows down and fills the forms until it overflows at the top. The actual pouring will take about six hours, and while being poured the mass will be agitated to help the flow and prevent the segregation of materials. This is further accomplished by adding a certain colloid to the mixture.

Experiments have proven so far that it is possible to make a mixture which behaves like a liquid, flows easily and fills all openings, and further, that it is possible to keep the heavier aggregates, stone and gravel, in suspension so that they are distributed evenly throughout the mass.

When Mr. Edison first made public his idea, he was listened to by some, while the engineering profession met his assertions with smiles. A revolution in the building business has to come, prices are soaring upward, everywhere cries are heard about forest preservation, timber famine, etc. Mr. Edison has taken a bold step in the right direction, and has kept on "stepping," until today he and his engineers, Small & Harms, feel sure of success. The first house will be poured in sections, to learn certain points, discover defects, etc., and it is expected that this first pouring will be made this summer. If successful, a larger pouring, comprising cellar and first story, will be made as soon as possible, and the next pouring will include the whole house.

Difficulties encountered have been numerous and the men doing the work do not expect "plain sailing," with these pourings, especially not the first one; but so much seemingly impossible has been done already, and they feel sure they will be able to overcome arising obstacles successfully.

A large capital will be required to build houses in this way, but this is rather an advantage. It will take home building out of the hands of speculators and irresponsible men, building in "any old way." It will enable people to own a home, without having to pay twice its cost, and it will reduce living expenses, cutting out fire insurance and repairs. The absence of mice and rats and other vermin will further improve conditions, and the house will be sanitary in every respect.

The Grand Marais School.

Concrete has come to be recognized more and more as the ideal building material for the construction of structures wherein the safety of human lives are concerned, such as school houses, theaters, auditoriums, churches and exhibition halls, to say nothing of apartment houses and residences. It is not only a fireproof building material, but sanitary and durable beyond question. The Grand Marais Public School Building at Grand Marais, Minn., shown in this issue, was built of Anchor continuous air space concrete blocks at a cost complete of $30,000. This same structure could not have been built of any other material comparing with it in strength and durability for anything like the same cost. The building is 62′ by 82′, and the interior is finished in birch walnut, steam-heated and with an independent electric light plant.

The architect, Clyde W. Kelly, of Duluth, Minn., in designing this school house, departed from the usual type and is to be congratulated. In simplicity of treatment and in the securing of the maximum amount of light he has succeeded admirably. This feature alone should recommend it alone to intending builders of similar types of construction. The interior arrangement is all that could be desired and each school room is large, well ventilated and perfectly lighted.

The blocks used in the building were all made on the Anchor Concrete Block Machines, and the plaster was applied direct to the concrete blocks without lath or furring strips.

As is well known blocks made by this system are frost and moisture proof, as the outer and inner blocks are not joined but bonded together with four, one-quarter-inch galvanized iron rods eight inches long and turned one inch at each end.

The blocks used in this building were made on the standard size machine manufactured by the Anchor Concrete Stone Company, of Rock Rapids, Iowa. This machine makes blocks that lay in the wall 8″ high and 24″ long and any width from 8″ to 12″. Charles W. Bradley, the general manager of the Anchor Concrete Stone Company, has received letters from the architect and the owners of the building expressing their entire satisfaction with the building.

First Concrete Lighthouse Erected in the Open Sea.

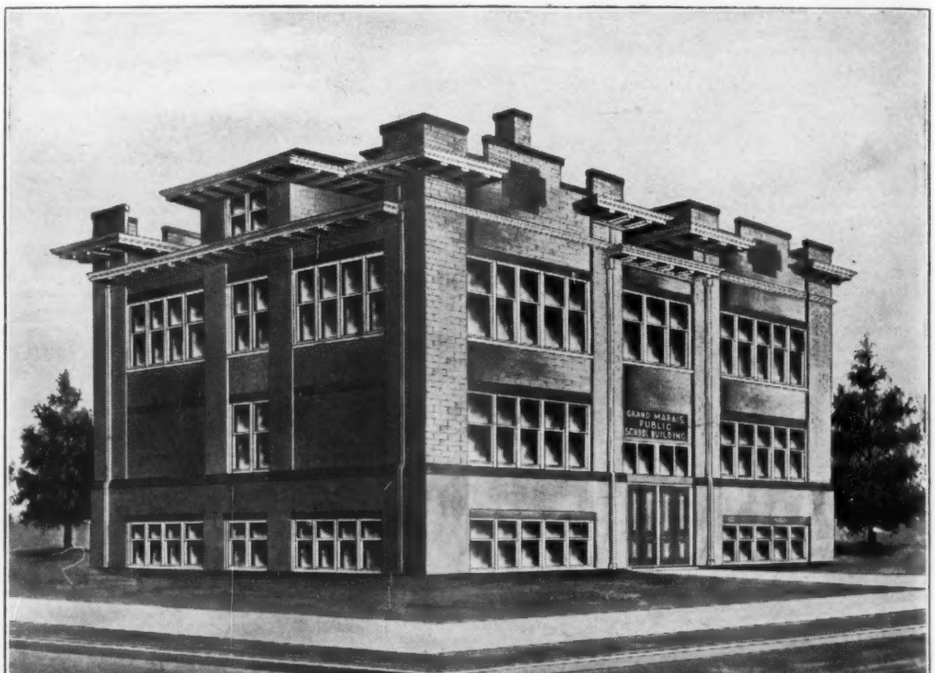
CLINTON, MASS., May 17.—The first ferro-concrete lighthouse erected in the open sea was recently erected on One Fathom bank, Strait of Malacca, about fifteen miles from the nearest land on the Malayan coast. It takes the place of an iron screw pile lighthouse and is believed to be the first of its class constructed in the open sea in comparatively deep water (twenty feet) on a sand bank subject to tidal erosion. The focal plane of the light is ninety-two feet above high water.

The seventeen foundation piles are built of steel rods laced together with steel wire and covered with concrete. The concrete was in the proportion of one of Portland cement to two and one-half parts of granite broken to pass at all angles through a three-quarter inch ring and one and one-half parts of sand. The piles are sixty-three feet long and were sunk to an average depth in the sand of twenty-six feet nine inches.

The foundation piles were arranged in octagonal form, the center pile being a five-foot diameter cylinder filled with concrete, an inner ring of eighteen-inch square piles at a radius of nine feet nine inches and an outer ring of two-foot square piles at a radius of twenty feet.

From each pile a ferro-concrete column was carried up to the level of the first floor, twenty-one feet above the main bracing. Intermediate between the main bracing and first floor a ferro-concrete bracing was fixed of radial beams, strengthened by steel bars and shearing bars fitted between the tension bars. The first floor is supported by ferro-concrete radial beams and by the inner and outer ring beams. The gallery, five feet wide, is carried on a continuation of the radial beams in the form of a cantilever. The ferro-concrete floor is five inches thick, finished with a rendering of cement mortar.

From the first to the third floors the intervals between the outer ring standards are walled in with ferro-concrete. The central column is two feet in diameter and is carried to the top of the building. From the third floor eight radial beams of reënforced concrete rise thirty feet to the level of the service floor. These are braced by two sets of reënforced concrete beams. Eight radial beams support the floor at the top level, and to this floor is bolted the cast iron base of the lantern, which is twelve feet in diameter. The total weight of the completed structure is about a thousand tons and the total cost about $145,000.



SCHOOLHOUSE AT GRAND MARAIS, MINN., BUILT OF ANCHOR CONCRETE BLOCKS.

Concrete Pier at Ocean Park.

OCEAN PARK, CAL., May 20.—A contract has been let by the Ocean Park Bathhouse Company to the Atlantic, Gulf and Pacific Construction Company for the erection of a 650-foot concrete pier at the foot of Marine Street.

The structure will be built on the site of the present wooden pier and will carry the intake pipe of the bathhouse. The piles will be of reinforced concrete after the general design of those in the Colorado Avenue pier in Santa Monica. It is proposed to extend the structure to a length of 1,600 feet at a later date. Work will be started at once.

New Corporation Formed.

WATERVILLE, ME., May 16.—A new corporation has been organized in this city and will be known as the Emery Hill Concrete Company. The capital stock is placed at $10,000 and the directors are Amos F. Gerald, of Fairfield, and Edwin Towne and Harvey D. Eaton, of this city, with Mr. Gerald as president, Mr. Towne as treasurer and Mr. Eaton clerk.

Holds Annual Meeting.

CHICAGO, ILL., May 12.—The annual meeting of the Cement Products Exhibition Company was held on May 11 at its offices, 115 Adams Street. Over three-fourths of the stockholders were represented at the meeting.

The report of the treasurer showed that the cement show of last February was a success financially as well as otherwise. After all expenses had been paid there was a surplus left, more than sufficient to cover the deficit incurred on account of the first annual cement show in December, 1907.

A resolution was introduced and unanimously adopted expressing the sentiment of the stockholders as opposed to the payment of any dividends and favoring the expenditure of all earnings arising from each show toward the promotion of succeeding exhibitions.

The following officers were elected for the ensuing year:

President—Edward M. Hagar.

Vice-President—Norman D. Fraser.

Secretary-Treasurer—J. U. C. McDaniel.

Executive Committee—B. F. Affleck, chairman; J. U. C. McDaniel, George S. Bartlett.

Directors—Edward M. Hagar, president Universal Portland Cement Company; Norman D. Fraser, president Chicago Portland Cement Company; A. St. John Newberry, president Sandusky Portland Cement Company; D. McCool, president, Newaygo Portland Cement Company; E. W. Shirk, president United States Cement Company; B. F. Affleck, general sales agent Universal Portland Cement Company; J. U. C. McDaniel, sales manager Chicago Portland Cement Company; C. A. Whyland, president and general manager Elk Cement and Lime Company; George S. Bartlett, vice-president Western Portland Cement Company.

Fine Specimens of Concrete Monuments.

UNION, MASS., May 18.—The Clinton Concrete Company has begun the making of concrete monuments at its factory on Sterling Street, and has produced some very fine specimens. Superintendent Nelson Mather has finished the construction of a monument of three sections for Frank L. Kinnear, of this town, which will be shipped to St. John, N. B., to be erected on his parents' lot. Another of similar design is now being lettered for a Worcester party.

New Incorporation.

MADISON, WIS., May 6.—Articles of incorporation were filed today in the office of Secretary of State Frear as follows: Marbleite Concrete Company, Milwaukee; capital, $2,500; incorporators, Walter B. Potter, Charles L. W. Crosby, August Fiske.

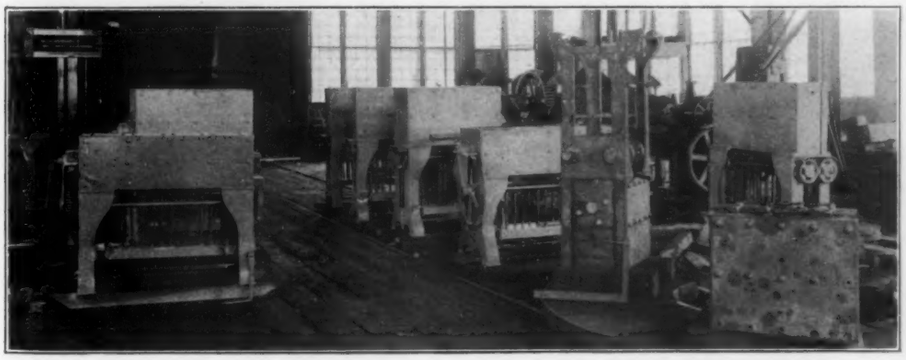
The Superstructure of the McKinley Bridge.

In the issue of ROCK PRODUCTS for September, 1907, some advance particulars were given regarding the McKinley system's big new bridge, which is probably the longest of those spanning the Mississippi River. It reaches from Venice, Ill., to North St. Louis. Though some changes in the original plan have been made, they are of minor importance. The west or St. Louis approach will begin at Ninth and Salisbury Streets and will form an elevated structure from this point to the water's edge. The four main piers are completed, and within a few days twenty-one carloads of steel for the superstructure have arrived and the process of erecting it is now under way. Eighteen cars of steel rails for the Illinois Traction System's line in St. Louis are en route and expected soon to arrive here and track laying be inaugurated before the close of this month.

The contract for the main piers of the bridge were taken by the Mississippi Valley Bridge and Iron Company, of Leavenworth, Kan., and also by the Stobie Steel Construction Company, of Chicago, the latter company to build the approach to the bridge. The American Concrete Company, of Chicago, is furnishing the reinforced concrete pipe piling. The piling average twenty feet in length and are fourteen and one-half inches in diameter. They are being manufactured at the company's plant at the foot of Salisbury Street. The Union Sand and Material Company's Red Ring brand of cement is used.

The Meyers Construction Company, of St. Louis, are driving the piles and will put up the timber trestle on the East St. Louis approach.

R. D. Smith, president of the Central Illinois Construction Company, and who is also the general manager of the McKinley system, has an office in a temporary structure on the company's land. F. E. Washburn is the resident engineer for St. Louis for the Electric Bridge Company.



MACHINE SHOP OF THE CONCRETE STONE AND SAND COMPANY. YOUNGSTOWN, OHIO. STRUCTURAL TILE MACHINES READY FOR SHIPMENT TO THE NEW YORK PLANT.

The Illinois Traction System has about 500 miles of electric railway in Illinois. It will have its own passenger and freight terminals in St. Louis and the improvements at St. Louis will, it is estimated, cost about $5,000,000. It is expected that the road will be in commission by January 1, 1910.

Northwestern Plans for Sixth Annual.

At a special meeting of the executive committee of the Northwestern Cement Products Association, called by Martin T. Roche, president, held at the Commercial Club in the city of Minneapolis, it was announced that the sixth annual convention will be held in the Twin Cities on February 28 and continuing until March 4, 1910. The convention will be formally opened Monday night and close at 10 o'clock on Friday evening.

Propositions relative to a building wherein to hold the convention have been received from both cities. No definite action was taken. The announcement of the place and city will be made later.

The success of the last convention places the Northwestern Cement Products Association among the real leaders in the concrete movement. Time, money and energy will be freely spent to make the sixth annual convention memorable in the Northwest.

File Articles of Incorporation.

SACRAMENTO, CAL., May 20.—The Mount Shasta Volcanic Hollow Tile and Cement Company, capitalized at $1,000,000, filed articles of incorporation here today. The directors are Abner Weed, E. L. Williams, W. E. Tebbe, George A. Tebbe and R. S. Taylor. As its name indicates, the company will engage in the manufacture of cement, cement tiling and building blocks. The plant will be located at some railway point near Grass Lake, where Abner Weed owns a large tract of land containing cement properties. The headquarters will be at Yreka.

New Concrete Company for Somerville.

SOMERVILLE, N. Y., May 18.—The Suburban Concrete Block Company has been incorporated for the manufacture and sale of concrete blocks, with a capital of $100,000. The officers of the new company are: President, H. F. Dowell, Medford; treasurer, E. R. Hubbard, Somerville.

Government Reclamation Service Satisfied.

PORTLAND, ORE., May 19.—Tests of reënforced concrete water pipe for high pressure service, which the United States reclamation service has been conducting at Hermiston for some time, have proved so satisfactory that the government will install a two mile pipe line of reënforced concrete, the first one ever made, for use in the Malheur project.

In addition to the fact that the tests were made under the direction of Supervising Engineer Ernest G. Hopson, of the Portland office of the reclamation service, the result is especially important to Portland because the experiments tend to prove that reënforced concrete is the cheapest as well as the most satisfactory kind of pipe for high pressure water use.

The government reclamation service is about to built two miles of high pressure main for the Umatilla irrigation project and it was desired to utilize reenforced concrete for this work if tests showed it to be satisfactory. Several sections of pipe were constructed with a four-foot channel and a shell three inches thick. This pipe was subjected to a pressure varying from sixty to seventy pounds per square inch.

The result of the tests showed conclusively, according to Mr. Hopson, that reënforced concrete is suitable for the purpose of the government and it has been decided to build the entire main of that material. The advantages of the concrete pipe, according to the engineers, are that it is about one-half as expensive as steel or iron pipe, just as permanent and that in fact its cost is only a little more than that of wooden pipe.

While concrete pipe could not be used under the river owing to peculiar conditions of laying such a main, it is believed that it might be applied very generally by the city in extending the present water system. The tests just completed by the government are the first official ones that have been made with reënforced concrete pipe.

Involuntary Petition in Bankruptcy.

JANESVILLE, WIS., May 17.—An involuntary petition in bankruptcy having been filed against the Janesville Cement Post Company by Michael Hayes and other petitioners, the United States Court has appointed C. W. Jackson receiver and the hearing will be held next Saturday. The company was incorporated in 1902 with a capital stock of $200,000 and the officers named were: H. W. Morgenthaler, president; Michael Hayes, vice-president; H. H. Clough, secretary, and Thomas S. Nolan, treasurer. A large plant was erected at the foot of South Main Street and the manufacture of cement posts was commenced on a large scale. The business, however, in some manner failed to meet expectations and manufacturing operations were discontinued last autumn. There has been a lack of harmony among the stockholders for some time and the latest move has been deemed the most effective method of winding up the company's affairs.

Document Filed with Secretary.

HARTFORD, CONN., May 20.—The Seymour Concrete Company has filed articles of incorporation with the secretary of state. The authorized capital stock is $30,000, the incorporators being: E. A. Harriman, H. E. Drew and S. B. Cheney. The company will manufacture and deal in cement and other building materials.

Concrete and Steel Highway Bridges.

BY N. J. DOUGLASS, OF THE ENGINEER COMMISSIONER'S DEPARTMENT, DISTRICT OF COLUMBIA.

The question of bridge design and construction is so comprehensive and inexhaustible in fact that in attempting to speak upon it I am somewhat perplexed as to what salient points to select for comment.

It appears, however, of paramount import that such matters as I might touch upon would better be based upon my own experience rather than taken from book records, and therefor I am going to describe, with the help of pictures, typical bridges with whose design and construction I have been identified and with whose defects and possible good points I am familiar.

In doing so, I will, without attempting logical sequence, and without going into detail comparisons, endeavor to point out certain structural features of each bridge and their raison d'etre, selecting only those points which might escape one in making cursory observations of these structures.

It might be well before launching into specific descriptions to invite your attention to the great progress which has taken place in highway bridge design during the last ten or fifteen years. It is not so long ago, possibly not more than ten years, that the highway bridge engineer and his creations, in this country, were looked upon by our brother railroaders as æmemic attempts of skinning their competent heavy structures, to meet the pockets of county commissioners, and the light vehicular traffic incidental to rural roads. While conceding without reservation the successful pioneer labors of this eminently able branch of our profession, I am glad, as a highway engineer, to feel that our bridges are no longer below the high standards set for railroad work. Our problems of maintenance and replacement are much easier of solution, but as an offset we must give careful consideration in design and construction to the appearance of structures. This motive is, as a rule, not seriously considered in the design and construction of railroad bridges.

The demand for more sightly highway bridges has called for the elimination of the common Pratt truss and similar unpleasing forms of steel construction, and their replacement by arches and solid girders of various types and the occasional use of trusses with curved or partially curved chords.

In modern design, regard being given to appearance, it is necessary to consider the harmony with its surroundings. Great care must be used in the general design to assure one that the general lines will be logical and therefore graceful.

From sightly bridges we are passing into ones that are ornamental. This means architecture. It means the coöperation of the architect and the engineer. The design by the engineer of the bridge in all its lines and structural details, and the final architectural detailing of the structure to better set off its structural component parts, accentuating main parts by the introduction of proper detail.

There are occasional cases of foolish architectural elaboration of simple structures where ornamentation is applied illogically, indicating that the designer was without proper knowledge of the essential structural features involved. These sporadic cases should not militate against our profession, having associated with them architects competent to appreciate the logical development of extremely simple bridge lines. My experience for the last ten years warrants me in saying, with conviction, that the best results will be obtained by such coöperation.

In this connection, I would like, however, to strongly emphasize the absurdity of any one other than an engineer determining upon the general lines of a bridge, its structural layout and its general details.

Much of our progress in highway bridge construction is the direct result of the advent of concrete, plain and reinforced. Ten years ago concrete, as a bridge material other than for foundations, was a novelty; today it is almost standard.

Ten years ago we regarded a working pressure of three hundred pounds per square inch as a bold departure from established precedent. Last year I saw a design in which the concrete in compression was stressed over one thousand two hundred pounds, and many bridges are standing today designed for maximum pressures of seven and eight hundred pounds per square inch.

We now have, in this country, a concrete arch with a span of two hundred and thirty-two feet. One is building with a span of two hundred and eighty feet, and in New York Mr. Burr has designed a reinforced concrete arch of seven hundred and ten feet span.

There is a temptation in using this admirable material of construction to decrease the factors of safety in order to meet the demands of competition, and to over-ornament concrete bridges because of the comparative cheapness of such ornamentation. In my judgment concrete is a material which should be

handled in a simple manner with bold detail, with comparatively little ornamentation and should never be made to simulate cut-stone work. Structures should always frankly confess the material of which they are built, and one should bear in mind that designs are possible in concrete which were not possible to the Romans and their marble details, however beautiful, are not, as a rule, sufficiently bold to be brought out in proper relief in concrete work, (at least without modification).

In concrete design we must bear in mind that concrete is built today very largely with unskilled labor, under, as a rule, untrained foremen, at extremely low prices which will not permit of much detail, and further it is only after years of experience that designers of form work are able to attain forms whose removal may be effected without injury to fine arrises. Where fine details are attempted, the destruction of the arrises results in unsightly work, which is often further aggravated by unsuccessful patching.

I will not burden you at this time with an academic discussion of maximum permissible unit stresses, diagonal tension, shifting neutral axis, variable coefficients of elasticity, nor the proper flange widths of T beams, but as I am going to deal largely with concrete arches I think it might be well to say that calculations using the common theory of arch design are sufficiently accurate for arch determination. The elastic theory is more elegant, and where time permits in important work it should be used as a check upon the final design, but my analysis indicates that the differences between maximum pressures determined by the common theory and the elastic theory will not exceed one or two per cent.

I cannot help feeling that there has been a good deal of "bunkum" worked off upon the busy general engineers by commercial experts who have created a general impression that if you cannot figure in calculus you cannot design a reinforced concrete arch with a reasonable degree of accuracy.

The introduction of concrete in bridge design has been the greatest boom to us, not only in obtaining sturdy structures at reasonable cost, but also ones that are pleasing to the eye. For the last nine years we have been gradually replacing all of the small county timber bridges with concrete ones, using as a rule the old masonry abutments without material modification.

The maintenance of county bridges, located as they are in Washington upon three hundred miles of road, have always been a cause of annoyance and great expense, due to the wooden floors failing under occasional excessive loads brought upon them. I suppose that we have at least one damage suit a year, and the District is compelled to pay a considerable amount of money, because the people claim that their horses have been injured in some way by getting their feet caught in slightly worn planks. In such cases it is almost impossible to get contradictory evidence to protect the city from financial loss. In consequence of these troubles and the difficulties of proper inspections, because of the distance of the small bridges from the city proper and because of the desire to get bridges pleasing in appearance and amply strong to carry as heavy loads as the approach roads, we have replaced practically all of our timber county bridges with concrete. These bridges are designed to carry twenty-ton road rollers or wagons and have given entire satisfaction.

In designing concrete bridges, in fact all concrete structures, the designer has to guard himself against the use of excessive detail and unnecessary ornamentation. The more feet you can get highly ornate details in concrete at comparative small cost attempts the inexperience designer into just such inharmonious design as is presented to you.

The Connecticut Avenue bridge, which has recently been completed in Washington, consists of five 150-feet span arches and two 82-feet arches, the large spans being separated from each other by 20-feet piers and from the small arches with 37-feet abutment piers. The bridge has a total height of 130 feet above the creek, is 52 feet wide and contains 80,000 cubic yards of concrete. It cost about $850,000.

* Paper read before the Engineers' Club of Baltimore. The lecture was illustrated by stereopticon views. Various types of bridges were shown and each form of construction was described by Mr. Douglass.

Oklahoma Show Dates.

OKLAHOMA CITY, OKLA, May 16.—D. C. Patterson, the energetic secretary of the Oklahoma Cement Users and Contractors' Association, is already making preparations for holding the next show. In a recent communication he says:

We will hold our annual meeting and cement show September 29th to October 8th, 1909, at Oklahoma City, Okla., at the State Fair Grounds. This being on the same dates of the State Fair, which has developed into one of the greatest attractions of the Southwest, will insure us a large attendance, not only from our own state but from the surrounding territory.

The State Fair Association will feature this show in their advertisements, which will bring it prominently before every citizen of the state. The season of the year will permit of many new and interesting features being conducted by manufacturers along lines of demonstrating machines and machinery for handling cement concrete. Exhibitors in this line can make practical tests which are not possible at the mid-winter shows for the reason of cold weather and shortness of time. The ten days of this show will certainly be the most important part of the year's business; and no manufacturer or interested worker can afford to miss this opportunity to get acquainted.

A cement testing plant will be in operation during the entire time, thus affording users of cement an opportunity to become familiar with the methods of testing cement, as well as the better mixtures, to be used in the varied lines of work. Expert engineers will be present, from whom valuable information can be obtained on all points of interest.

A space of 25,000 square feet has been secured at great expense and the management of this show purposes to make it the greatest cement show ever given in the United States.

Plenty of Orders on Hand.

BAY CITY, MICH., May 16.—The plant of the Bay City Cast Stone and Block Company is running steadily, with a daily output of four hundred blocks. The company has a large number of orders on hand and anticipates enough to keep the plant in operation until late in the fall. A crew of seven men is employed. This force will be increased as soon as the weather gives promise of continuing fair. Last winter the company added additional machinery, which gives the factory a daily capacity of five or six hundred blocks.

Cost of Big Theater to Exceed $200,000.

The theater which is to be erected on Walnut Hills, Cincinnati, will be one of the most pretentious structures in the city, containing a number of features which will be absolutely new to any theater outside of New York and Chicago.

The theater will be a three-decker, so to speak. There will be a theater on the ground floor with a total seating capacity of 2,800, the largest in Cincinnati. Above the theater will be a huge café, 100'x 124' in size. Above the café will be the greatest roof garden theater outside of New York. It, too, will have a space of 100'x124', and there in the open air grand opera will be given.

The total cost of the theater will exceed $200,000 and work will be begun soon.

The new theater, to be known as the Orpheum, will be of concrete, steel and brick. The ornamental front on McMillan Street will be of white glazed brick. The main auditorium will contain more retiring rooms than any theater in Cincinnati. There will be conveniences on the main floor, and also for patrons of gallery and balcony. The main floor will have a seating capacity of 900, the largest main floor in town, excepting that of Music Hall. The supports of the proscenium arch will be massive marble columns.

The decorations will be elaborate and costly. The ceiling will be supported by several of the greatest steel girders ever placed in similar buildings. These girders will support a fireproof ceiling, which will be the floor of the café, into which the theater orchestra will move after each performance. Two elevators will reach balcony, gallery, café and roof garden. There will be located over the foyer a ballroom 80' long, where it is expected the fashionable people of Avondale and Walnut Hills may hold private parties.

There will be a 10' area at the side of the building, its full length, to serve as an exit if needed. There will be numerous exits, six from the balcony and gallery, café and roof garden, several of the fire escapes going to the top. All stairways are to be enclosed in fireproof wells, and in fact there will be nothing combustible in the theater save furnishings. The promoters of the theater are enthusiastic over the plans, which were prepared by C. C. Weber & Brother.

Will Make Concrete Brick.

GRAND RAPIDS, WIS., May 20.—A new company was organized in this city, which will be known as the Carey Concrete Company, and it will engage in the manufacture of concrete brick.

The board of directors of the new company is comprised of F. J. Wood. W. H. Carey, A. F. Billmyre, R. L. Nash and H. S. Boles. The officers elected were: W. H. Carey, president and manager; F. J. Wood, treasurer, and R. L. Nash, secretary. The company was organized with a capital stock of $10,000, fully paid in.

Bridge Contract Awarded.

The contract for a concrete bridge over the Illinois and Michigan canal at Kedzie Avenue, Chicago, was awarded by Commissioner of Public Works Hanberg to the Fitzsimmons & Connell Company at its bid of $22,000. The bridge is similar to the one at Ashland Avenue and is to be completed in four months.

Wisconsin Concern Incorporates.

MILWAUKEE, WIS., May 19.—Great Northern Concrete Company, incorporated with a capital of $15,000. The incorporators are: James W. Utley, Reinhold Roehr and Julius E. Roehr.

Illinois Agents for Aquabar.

The Wisconsin Lime and Cement Company, whose offices are located in the Chamber of Commerce Building, Chicago, have become the sole agents and distributers for the state of Illinois for "Aquabar," as they state, the only absolute and reliable waterproofer. The Aquabar Company, 1228 Locust Street, Philadelphia, Pa., guarantee this product, and, when necessary, are willing to put up a bond to substantiate their statements. They state that its life is everlasting and that its cost is most economical; as frost is the common enemy of cement, so is Aquabar the common enemy of frost and water. By mixing within, Aquabar waterproofs cement stucco, cement concrete, cement blocks and cement bricks. By external application it waterproofs brick walls, stone work, terra cotta and cement floors. Aquabar bars dampness, water, frost, dust, corrosion. It prevents deterioration, disintegration, granulation, discoloration. It preserves iron reinforcements, cement floors, dry walls and all absorbent materials. They claim that it is the only waterproofer that cannot fail to mix thoroughly with cement, insuring absolute waterproofness; that it is the only waterproofing compound that crystallizes and entirely seals the voids between the sand and cement, thus becoming a part of the general mass and waterproofs for all time; that it is the only waterproofer that has ever stood the test of sixty pounds' pressure to the square inch without effect on a slab of only three-quarter-inch thickness, and that it is the only waterproofer that can afford to furnish a written guarantee and even a bond if necessary.

In their advertisement an illustration is given of the 2,300-foot tunnel at Soldier's Home, Hampton, Va. This tunnel is built of reinforced concrete, waterproofed through and through with Aquabar and made absolutely moisture-proof. The floor of this tunnel is three feet below water line and is built for the purpose of carrying the heating pipes and electric service to the various buildings. Aquabar was selected by the War Department in preference to all competitors because the product is guaranteed.

The East has long known the merits of Aquabar. Many beautiful buildings have been treated with it with perfect satisfaction. Capt. John Young's residence, Young's Pier, Atlantic City, N. J., one of the handsomest concrete edifices in that city, noted for the artistic beauty of its buildings, is waterproofed with Aquabar, as is also the pier. The German-American Brewing Company Building, Buffalo, N. Y.; the Rest Pavilion, Atlantic City, N. J.; the Lubin Palace of Delight, Philadelphia, Pa.; the bleachers, Athletic Ball Park, Philadelphia, Pa., and others too numerous to mention have all been waterproofed with it.

The Wisconsin Lime and Cement Company will willingly give all information desired. Booklets, literature, etc., sent on request.

Edwin C. Eckel, one of the best known experts on the cement industry of the United States, the author of "Cements, Limes and Plasters," the standard work on these materials, and, until recently, in charge of the cement work on the United States Geological Survey, has written a book entitled, "The Portland Cement Industry From a Financial Standpoint," which ought to prove invaluable at once to the banker who is invited to aid in the flotation of cement securities and to the investor who is invited to buy them. As Mr. Eckel states in the preface, his book will have served its purpose if it aids either banker or investor to differentiate between securities offered against successful existing plants or sound projects, with reasonable prospects of success, and those issued against foolishly planned or fraudulently promoted propositions.

The Portland cement industry is of great and growing importance. Cement plants, when properly financed, located, constructed and managed, have made very satisfactory returns to their stockholders. There is still room in the industry for honestly and intelligently managed new enterprises, but competition is now so keen that there is no room for weak plants—for plants that are poorly located or designed, for companies that are dishonestly promoted or carelessly managed. The manufacture of cement is a legitimate industry, and the methods of mining promoters have no place in it.

Mr. Eckel's book differs from any previous publication on the cement industry in that it devotes itself chiefly to the financial side of the subject. In fact, it is the first authoritative presentation of the financial side of an important American industry. Matters of purely technical importance are for this reason subordinated to the questions of financial methods and profits. Such subjects as raw materials and manufacturing processes are discussed, therefore, only as they have a distinct bearing on financial results.

"The Portland Cement Industry From a Financial Standpoint" is attractively prepared in a typographical way and substantially bound. Price per copy. $2 net. Published by Moody's Magazine, 35 Nassau Street, New York.

Strong Organization.

(Continued from page 29.)

by the expressed permission of such original contractor. Final payment shall be evidence of completion of such contract. Contractors shall furnish darbies. Only one member of any firm of contractors shall be permitted to work with tools, this clause having reference to actual work of plastering only.

39. Both parties hereto agree that they will, at their annual election of each year, elect an arbitration committee to serve one year and until their successors are elected and qualified. In case of death, expulsion, removal or disqualification of a member or members on the arbitration committee, such vacancies shall be filled by the association or union at its next regular meeting.

40. The arbitration committee for each of the two parties hereto shall consist of five members, and they shall meet not later than the fourth Thursday of January of each year in joint session, when they shall organize a joint arbitration board and shall elect a president, secretary, treasurer and umpire.

41. No member who is not actively engaged in the plastering trade, or occupies any other offices in his association or union except the office of president, nor holds a public office, either elective or appointive, under the municipal, county, state or national government, shall be eligible to act as a representative in this trade arbitration board; and any member shall become disqualified to act as member of this trade joint arbitration board and cease to be a member thereof immediately upon his election or appointment to any other office in his association or union, or to any public office or employment. No foreman shall act on arbitration committee except with the consent of the Journeymen Plasterers' Protective and Benevolent Society of Chicago.

42. An umpire shall be elected who is in nowise affiliated or identified with the building industry, and who is not an employe nor an employer of labor, nor an incumbent of political office.

43. The joint arbitration board shall meet to transact business from time to time as occasion may demand. Meetings may be called on three days' notice by the president upon application of three members.

44. When a dispute or grievance arises between a journeyman and employer (parties hereto), or an apprentice and his employer, the question at issue shall be submitted in writing to the presidents of the two organizations, and upon their failure to agree and settle it within two working days, or if one party to the dispute is dissatisfied with their decision, it then shall be submitted to the joint arbitration board at its next meeting. They shall hear the evidence and decide in accordance therewith by majority vote, by secret ballot, (decision to) be rendered in writing and be final and binding on both parties.

45. If the joint arbitration board is unable to agree, the umpire shall be requested to sit with them, and, after he has heard the evidence, cast the deciding vote.

46. The joint arbitration board has the right to summon any member or members affiliated with either party against whom complaint is lodged for breaking this joint arbitration agreement or working rules, and also appear as witnesses. The summons shall be handed to the president of the association or union to which the member belongs, and he shall cause the members or member to be notified to appear before the joint board on date set. Failure to appear when notified, except (in the opinion of the board) valid excuse is given, shall subject a member to a fine of twenty-five dollars ($25.00) for the first default, fifty dollars ($50.00) for the second, and suspension for the third.

47. The salary of a representative on the joint arbitration board shall be paid by the association or union he represents.

48. Any member or members affiliated with either of the two parties hereto, violating any part of this agreement, or the working rules established by the joint arbitration board, shall be subject to a fine from ten to two hundred dollars, which fine shall be collected by the president of the association or union to which the offending member or members belong, and by him paid to the treasurer of the joint arbitration board not later than thirty days after the date of the levying of the fine.

49. If the fine is not paid by the offender or offenders it shall be paid out of the treasury of the association or union of which the offender or offenders were members at the time the fine was levied against him or them and within sixty days from date of levying same; or in lieu thereof the association or union to which he or they belong shall suspend the offender or offenders and officially certify such suspension to the joint arbitration board within sixty days from the time of fining, and the joint arbitration board shall cause the suspension decree to be read by the president of both the association and union at their next regular meetings, and then post said decree for sixty days in the meeting rooms of the association and union. No one who has been suspended from membership in the association or union for neglect or refusal to abide by the decision of the joint arbitration board can be admitted to membership except by paying his fine or by unanimous consent of the joint aribtration board.

The joint agreement and working rules shall work in conformity with the working rules of the Operative Plasterers' International Association.

On behalf of the Employing Plasterers' Association of Chicago:

OSCAR A. REUM,
T. J. MCNULTY,
R. S. HALDEMAN,
WM. BALHATCHET,
WM. GAVIN,
Arbitration Committee.

On behalf of the Journeymen Plasterers' Protective and Benevolent Society:

GEORGE E. CARTER,
J. E. WRIGHT,
MATT DUFFY,
H. M. IRONS,
C. COLYER,
Arbitration Committee.

This agreement and working rules as above set forth shall go into effect April 1, 1909, and be in effect until April 1, 1912.

The members of the joint arbitration committee shall meet on the first Monday in December, 1911, to fix the joint agreement, working rules and wage scale for 1912 and thereafter.

Gypsum in Nova Scotia

Consul John E. Kehl furnishes the following information concerning the new deposits of gypsum which are said to exist near Sydney, Nova Scotia:

A local railway company has acquired considerable land at East Bay, about fifteen miles from Sydney, which is said to contain inexhaustible deposits of gypsum. The whole extent of the company's present holdings and a large section roundabout appear to abound with the material. The deposit is being thoroughly exploited by the present owners, with the assistance of government experts. A calyz drill was used to ascertain the depth of the plaster; the drill was operated at the base of the face of a hill, and driven down about 80 feet; no break was found in the deposit. The analysis, straight through, shows nearly 99 percent of purity. Some twenty tests have been made, and it is claimed that in every instance the pure gypsum has been found at an average of ten to twelve feet beneath the surface. Tidewater with excellent shipping accommodations is less than three miles distant, and a bill is now before the Nova Scotia legislature for the construction of a line of railway from East Bay to Sydney.

American builders of machinery for use in gypsum mining, or for refining gypsum, might do well to correspond with J. C. Larder and Thomas Cozzelino, both of Sydney, Nova Scotia.

FT. DODGE, IA., May 12.—M. J. Haire and associates have purchased one hundred acres of gypsum and clay land in Webster county for the purpose of erecting and operating another tile factory and gypsum mill. The acreage lies directly south of the city and is easily accessible to railroads.

L. J. Mench, M. Am. Soc. C. E., general contractor, Monadnock building, San Francisco, Cal., has recently published "The Reinforced Concrete Pocket Book." It is a small book but covers the entire field of reinforced concrete very completely in a condensed form. The book contains useful tables, rules and illustrations for the convenient design, rational construction and ready computation of cost of reinforced concrete girders, slabs, footings, columns, buildings, retaining walls, tanks, grain elevators, coal bins, water pipes, sewers, dams, bridges, smoke stacks, piles, etc. The object of this pocket book is to place before the public in as concise a form as possible practical information in regard to reinforced concrete construction, and the author hopes that it will promote the use of reinforced concrete and be the medium of its standardization.

Side Talk

William S. Hotchkiss, 1509 Manhattan Building, Chicago, has a weather-proof filler and finish combined which is attracting considerable attention. It comes in a wide range of colors and can be applied to either stone, brick or marble as it not only fills the voids, making the material absolutely waterproof, but leaves behind a beautiful dull finish very much desired.

It can be applied to concrete blocks either by dipping them in the compound or by painting or spraying the same after the work is up. One feature that should especially recommend it to the concrete worker is the fact that it prevents efflorescence in concrete work. Those who have had kicks because of this fact should bear this in mind. It is not an oil composition and is not affected by acids, alkalies, intense heat or cold. Samples are sent free upon request, if you will mention ROCK PRODUCTS.

The gyratory type of rock crusher was brought to a complete success in the year 1885, after many years of costly experiments. No machine ever wrought a greater revolution in the rock crushing field, as it opened up entirely new fields of industry.

Many modifications and improvements have since been made in the gyratory type of crusher, but perhaps none have been quite so radical and, at the same time, so overwhelmingly successful, as those embodied in the Symons Crusher, a comprehensive description of which is given in the catalogue issued by T. L. Smith Company, under the caption "Symons Crushers."

The greatest objection to the old type of gyratories has been in their tremendous size, and their consequent great weight, the former necessitating no little difficulty and expense in installing the machine at the quarry and in elevating the material to be crushed, while the latter entails a very heavy expense in freight charges. All of these disadvantages have been entirely overcome in the Symons Crusher by reason of its being less than one-half the size and weight of other gyratories of equal capacity.

The T. L. Smith Company, whose offices are in the Old Colony Building, Chicago, Ill., are the exclusive selling agents for Symons crushers. They challenge comparison and claim the following points of superiority:

1. Half the weight; which means less freight; less cost of installation.

2. Half the height; less power required to lift the stone to feeding hopper; less head-room, or space.

3. Greater strength, because the central shaft is first, half as long, second, the strain is uniformly distributed and third, the ends are fixed, or securely held. Then again, the spider is stronger, as the pressure thereon is greatly reduced.

The frame is as thick and well ribbed as others, while it is specially reinforced by bottom spider arms. It is also clamped to the spider by the central shaft in addition to bolts.

4. Simplicity—One troublesome bearing is eliminated, there being only two bearings under pressure instead of three.

5. Durability—The eccentric bearings are perfectly aligned. The pressure per square inch is but little over half that of others. The dust is completely excluded and perfect oil bath lubrication. The gears are made of cast *steel*. The eccentric is heavier and of cast *steel*. The ring supporting head sustains in No. 5 less than six pounds per square inch pressure; others over 300 pounds, etc.

6. Leverage—Equal leverage applied in lower part of cavity where duty is greatest. Others have least leverage here.

7. Capacity—Greater length of opening; greater average or total movement of the head; hence greater capacity.

8. Feeding—Increased movement at top of head takes hold of large stones readily; and the opening being unobstructed by hub of spider, the stone will not "bridge."

9. Fine Crushing—Equal movement of head in every part admits using curved concaves to advantage, thus employing more surface in fine crushing. Greater capacity and less liable to choke.

10. Adjustment—Only the head is raised or lowered. No bearings are disturbed.

11. Repairs—Crusher less in height. Shorter and lighter parts. Parts easily accessible. Less special equipment. Babbitting made simple.

12. Discharge Chute—Bottom chute unobstructed by central shaft. Can be formed to discharge stone in more than one direction. Easily renewed.

Bay State Brick and Cement Coating, manufactured by Wadsworth, Howland & Co., of Boston and New York, is a perfect coating for the protection and decoration of concrete surfaces and also of brick and plaster, being composed of a cement base held in suspension by a volatile oil which evaporates on application.

This construction causes it to penetrate the surface of the above mentioned materials and become a part of them and not a mere skim coating. It contains no lead, and its snow-white surface is not affected by acids and gases. It contains no glue, caseine or water, and does not mildew, rub, crack or peel. It is not absorbent and will not change color when wet, and will stand steam and moisture on its surface without injury.

It is also so made that it may be applied to a damp surface where it is impossible to make paints stay. It dries with a dull finish and is made in white and colors.

It is a filler and surface finish for cement floors, preventing the powdering of the cement, thus making a sanitary condition for floors of public buildings, hospitals, schools, laboratories, etc.

It is unexcelled for mill and factory work on wood, concrete and brick, being sanitary, fireproof and free from all chipping, scaling and dropping, as it is not dependent on a binder that deteriorates.

Its before mentioned ability to be applied on damp walls and stay there has resulted in its use on swimming tanks built of concrete, where it is successfully used, giving the effect of a marble tank by its radiation of light. It may be scrubbed to remove dirt without injury and is non-poisonous.

It can also be used on interior woodwork, by itself, as a dull finish, and makes a perfect undercoat over which to apply enamels for enamel finish, as it dries hard as stone. It is also recommended by representatives for other high grade enamels as undercoat for enamels.

It is also fireproof (after it dries out) and may be used on interior smokestacks and other hot pipes, and will not burr off.

It is made only in liquid form ready for use, never in paste form, thus securing uniform results.

Investigations of Deposits of Cement Materials.

(Continued from page 27.)

great—luckily so, as the natural rock is difficult and costly to quarry.

The qualities of ganister that make it suitable for refractory brick are disputed, but seem to depend chiefly on its greater strength. It is used in furnaces that do not undergo sudden changes in temperature, and in situations where it will not come into contact with material that would flux with it.

Cement Looking Up in Chicago.

CHICAGO, ILL., May 22.—When Professor Cox announced from his high weather bureau tower that fair weather might be expected, the cement men pricked up their ears. That little announcement spelt volumes to every contractor and the truth or fallacy of the report was eagerly awaited. Then, when the weather man made "good" in his prediction and delivered the brand of weather promised, that happy smile became general and orders for cement began to look anxiously for a resting place.

The past month has brought about the settling of the labor difficulties which usually come up for argument in the spring; the realization of the builder that concrete is the material for his new building and, best of all, the placing of nice, fat orders for cement.

The consensus of opinion among the manufacturers is that from the way the spring market has set sail and with "Uncle Bill Taft" at the helm, the cement industry will have a record voyage the next few months. Then will that old worry of "Where is the next order?" be supplanted by that brighter one of "How can we fill all the orders on hand?" which is a trifle better, think you?

J. U. C. McDaniel, Chicago Portland Cement Company, stated that the cement business is rapidly convalescing from its recent attack of "dementia quieta" and is now showing improvement with each succeeding week. As Mr. McDaniel puts it, "That business, which we all knew was hovering somewhere in the air, has finally taken a notion to descend and be a good fellow. Orders for cement are now showing up as if they had an appointment. This is the time of the year when things should start to brighten up and, although they have been a little backward in their tendency to do so, we have waited for that time patiently and so now feel doubly repaid for our trouble."

"Weather conditions and business conditions," said Mr. Beck, Universal Portland Cement Company, "appear to travel hand in hand. While the weather refused to be peaceable this spring the cement trade refused to blossom forth in its usual spring style, but since the weather has assumed a different attitude and has permitted the cement man to work outdoors the cement business has taken advantage of its opportunities and has taken some good-sized leaps in the right direction. That's about all there is to say."

Said Mr. De Smet: "Yes, business has improved considerably in the past month and from all appearances the boat is going to sail smoother during the next few months than it has the last few. I see no reason why the year 1909 in the cement industry should not reach as great, if not greater, proportions than it did the past year. So far it has held its own nicely and we hope it will continue to do so. At least the cement man won't complain during the next few months."

Fred J. Morse, speaking for the Sandusky Portland Cement Company, said that as far as he could tell now the summer would be a most profitable one for the cement man. "The past month," said Mr. Morse, "has taken on that bright aspect so welcome to the cement manufacturer, and if things continue to hold their own as nicely as they have started out, a very satisfactory condition will prevail indeed. There is plenty of building going on in Chicago now and a good deal of cement is being called for. We have waited and times have come."

W. E. Cobean, Wolverine Portland Cement Company, has dropped his conservative mood for one of optimism. Mr. Cobean is in a more happy frame of mind over the turn things have taken in the cement line. Said Mr. Cobean: "Orders have started to come in quite freely of late, bringing with them that feeling of gladness. We knew that sooner or later the skies would clear and that 'sooner or later' is now here. So let's go."

Mr. Backus, representing the Atlas Portland Cement Company, spoke enthusiastically for the firm. Said he, "Business in the cement trade is good; the first few months were not as satisfactory as one might expect, but business has picked up wonderfully and the whole trade is showing new life. Calls for cement are coming in at a steady rate now and everything points to a most satisfactory summer and fall. Spring was a little backward, keeping down the demand for cement to some extent, but now that better weather has put in its appearance, better conditions may be looked for in the cement trade."

Mr. Cox, of the German-American Portland Cement Company, was busy when the ROCK PRODUCTS man called, but he found time to say: "We have no complaint to make; things are running along smoothly and there is a fairly active demand for cement. Conditions seem to be improving generally and everything points to a fairly prosperous summer. At least all the indications seem to point to that condition now."

Will Study Cement Industry.

NEW YORK, N. Y., May 20.—A. C. Davis, of Cambridge, England, the head of one of the largest cement plants in England, is in this country studying conditions in the cement making industry. He will visit many of the large plants in this country. Mr. Davis paid the American manufacturers a distinct compliment when he said in a recent interview, "Although we of England in beginning to make cement one hundred and fifty years ago were the first in the field, we have been outdistanced by American and German manufacturers. We are especially backward in our business methods."

In Hands of Receiver.

BEDFORD, IND., May 3.—The $1,000,000 plant of the United States Cement Company, of Bedford, is in the hands of a receiver. Charles L. Hoover, an employee and stockholder, filed suit in the Circuit Court asking for the receivership, whereupon Judge Wilson appointed E. W. Shirk, president of the company, receiver, and he is now in charge.

The company owes about $500,000 mortgage and bonded indebtedness and $130,000 in notes and accounts. The stock on hand consists of 120,000 barrels of cement. Mr. Shirk gave bonds, with his mother, Mrs. Shirk, and brother, Joseph Shirk, of Peru, as sureties.

This is the second time the company has been in the hands of a receiver. During the two years past the mill has had to be entirely rebuilt in order to operate, and then, with a large stock on hand, the market went to pieces.

Ogden Portland Cement Company.

The articles of incorporation of the new cement plant to be established in this vicinity has been filed with the clerk of Weber County. The corporation is known as the Ogden Portland Cement Company and its capital stock is $500,000. The incorporators and first officers are: Willard J. Bell, of Newaygo, Mich., president and general manager; Harold Day, Chicago, vice-president; Ralph Bristol, New York, secretary and treasurer; Alvin T. Thoits, Grand Rapids, Mich., and Henry C. Baker, of Ogden, directors. The business of this corporation will be the manufacture of Portland cement at a point north of Brigham City and about twenty-five miles north of Ogden, on an alkali flat, and known as Boxelder "Lake." The plans and specifications for a $300,000 plant with a capacity of five hundred barrels a day have been approved by the directors and work will be started at once.

Large Order for Cement.

MONTREAL, CAN., May 15.—The Frank B. Gilbreth Company has placed with the Vulcan Portland Cement Company, through its sales agent, the William G. Hartranft Cement Company, Ltd., of this city, the contract for all the cement required for the immense power development of the Grand Falls Power Company, of Grand Falls, N. B. The quantity is estimated to be 100,000 barrels or over, and it is the largest contract ever placed for Portland cement with a Canadian company for a single piece of work.

Old Officers Elected.

At the annual election of officers of the Empire Portland Cement Company, held recently, all the old officers were reëlected. They are: Gen. Charles Miller, of Franklin, Pa., president; George C. Miller, of Franklin, Pa., vice-president; J. B. Moorehead, of Franklin, Pa., secretary and treasurer; H. S. Hayden, of Syracuse, N. Y., manager.

Annual Meeting Held.

NAZARETH, PA., May 12.—The annual meeting of the Phoenix Cement Company, of Nazareth, was held recently. The following directors were elected: William Turner, A. W. Nelkirk, George W. Laub, W. H. Parsons, Morris Fellencer, William C. Anderson, Dr. A. C. Wood, C. C. Carman, W. B. Schaeffer, and others. The officers are: William Turner, president; Morris Fellencer, and W. H. Parsons, vice-presidents; A. W. Newkirk, secretary, and G. W. Laub, treasurer.

Open Office in Birmingham.

BIRMINGHAM, ALA., May 16.—The Standard Portland Cement Company, with works at Leeds, Ala., on the Southern and Central of Georgia railroads, have opened sales offices in the Brown-Marx Building. J. I. McCants, who is the company's sales manager, states that all indications point to a good demand for building material this year. He expresses himself as highly pleased with the opportunities offered by Birmingham as a distributing point for the South. The company is now making extensive improvements on their plant at Leeds, and the output will be increased to 400,000 barrels, annual capacity.

Dumont Clarke Elected Director.

NEW YORK, N. Y., May 19.—Dumont Clarke, president of the American Exchange National Bank, was elected a director of the Atlas Portland Cement Company to succeed the late J. S. de Navarro. Other directors were reëlected.

New Incorporations.

The Tidewater Portland Cement Company, of Wilmington, Del., has been incorporated under the laws of Delaware for $4,000,000.

The Sterling Portland Cement Company, of Wilmington, Del., has been incorporated for $1,800,000. The incorporators are F. R. Hansell, S. C. Seymour and George H. B. Martin, of Philadelphia, Pa.

Large Concrete Structure in Chicago.

The Born Building, which has just been completed at 340 to 344 Fifth Avenue, Chicago, probably is the best example of reinforced concrete construction in the central business district. There was not a pound of structural steel used in the entire structure. It is twelve stories high and has a frontage of 60 feet and a depth of 112. The twelve floors were constructed in twelve weeks and the work was completed thirteen days ahead of time. It is, next to the Ingalls Building in Cincinnati, the highest structure in which reinforced concrete has been used in this country. The cost of the building was about $225,000, or $35,000 less than were it of steel and tile. In addition to this, the owners have much more space than in a building of steel and tile construction.

The floors are of cement, 8 inches thick, and the columns are spaced 16x20 feet on centers. The floors in the stock rooms and tailor shops are of finished cement and in the offices they are of maple. Were the building constructed of steel and tile the floors would be 16 inches in thickness, against 8 inches, and in this way the owner has the advantage of 60,000 cubic feet of air more than in a similar structure of steel and hollow tile, thus permitting the employment of more people on each floor, as provided for in the state law governing the operation of factories.

M. Born & Company are the owners of the building. It was designed by Holabird & Roche and constructed by the Alling Construction Company.

Proposed Bridge of Big Blocks.

SPOKANE, WASH., May 10.—City Engineer J. C. Ralston stated recently that his specifications, which are not yet completed, will provide that the arch ring of the proposed bridge will be composed of separate plain concrete blocks, arranged the same as though the bridge were to be constructed of large granite blocks.

"This plan has been carried out in only two or three bridges in the United States," states Mr. Ralston, "and it has been found that this works fully as well, and is believed to be better, than one single reinforced concrete arch. By making separate blocks of concrete and placing them close together, lines of weakness are established between the blocks, and this has been proven to be a benefit.

"Should the arch ring be composed of one solid mass of concrete, and a crack should start in one place, it might travel clear through the arch, while with the block system a crack would travel only to a line of weakness. I have written to the engineers who constructed bridges on similar plans at Washington, D. C., Cleveland, Ohio, and Chambersburg, W. Va., and until I hear from them I will be unable to file my specifications with the city council."

Will Erect Sand Lime Brick Plant.

The Elliott Investment Company, Spokane, Wash., of which James F. Elliott is president and general manager, and V. W. Brasch, secretary and treasurer, intend to erect a plant for the manufacture of sand-lime brick at Spokane.

CLAY

MOUNT SAVAGE FIRE BRICK.

The Great Maryland Plant That Makes High Grade Refractories.

Having often been invited by the Union Mining Company—proprietors of the Mount Savage Fire Brick Works—located at Mount Savage, Md., to visit their plant, a ROCK PRODUCTS traveler concluded to accept the invitation, as he had known Mount Savage by reputation since boyhood days.

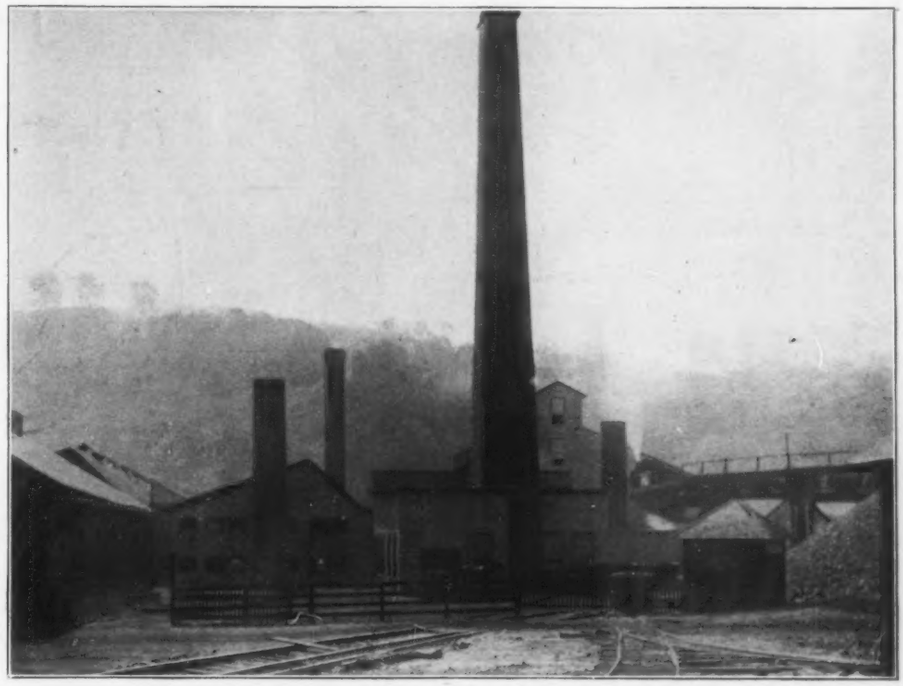
Leaving the Baltimore and Ohio Railroad at Cumberland, Md., and going via the Cumberland and Pennsylvania to Mount Savage, the first stop was at the company's office building, where he was received most cordially. One is most favorably impressed with this building, it being a substantial one, built of brick and occupied solely by the Union Mining Company and their varied interests, consisting of fire brick operations, coal and clay mining, foundry, etc.

After presenting my credentials at the office I was turned over to the superintendent of the fire brick department, and together we made a most thorough inspection of the clay mines and works. We boarded one of the company's locomotives and went to the mines, which are located about three miles from the works. I learned the company operate two locomotives and about fifty cars of a capacity of two and one-half tons each. These are not the cars used in the mines; of these latter there are approximately 100, with a carrying capacity of a ton each.

The clay is of two kinds—flint and plastic. This latter, to me, meant "soft" or "pliable," but, to my inexperienced eye, if there was any difference at all—they were both alike. The clay is mined by practically the same methods as coal, the mines being several hundred feet below the top of the mountains and quite a distance above water level. I was impressed with the close inspection given to the clay as it came from the mines.

We saw what seemed a mountain of clay at Mount Savage, and passed several other very large storage piles on our way up to the mines. I asked the superintendent if the mines were working and, if so, why they carried such an enormous stock. He said it was the policy of the company to insure the operation of the plant at all hazards, so far as a stock of clay was concerned; that notwithstanding the fact they now had on the surface sufficient to enable them to run the works full for several years (should labor troubles develop and prevent mining) they continued to produce more each day than was consumed by the operating department. I realized at once that this placed the company in position to take care of their customers under the most trying conditions, and that means considerable to large users of fire brick.

After returning to Mount Savage the superintendent began to explain their methods of manufacture, but one could not follow my crude explanations of such a technical subject even if I could remember all the details, so I will tell what I saw as the average reader would see it in as simple a way as possible.



GENERAL VIEW OF THE UNION MINING COMPANY'S WORKS AT MT. SAVAGE, MD.

The crude clay is placed in large pans and thoroughly ground and, after being screened, is conveyed mechanically to the wet pan and thence to the moulders. All the product from the Mount Savage works is moulded by hand and repressed, no machines being used. I might state there are virtually two "yards" working as one, with a total capacity of 60,000 nine-inch brick per day. This is the most favorable arrangement, as there would be no necessary let-up in the manufacture of brick should either of the "yards" be disabled through broken machinery, fire or any other reason. Each "yard" is in fact a two-story building; one 160'x80', the other 150'x70'. The lower floors of both "yards" are heated; one by steam, the other by stoves located in one end of the yard, the heat passing through flues located under the floors. The upper floors of both "yards" are used exclusively for drying special shapes. After moulding the brick they are permitted to remain on the drying floors until they are in proper condition to repress. After repressing they are again placed on the floor and allowed to dry until ready for burning.

At this stage the brick are loaded on barrows and taken to the kilns, of which the company has about fifteen, varying in capacity from 30,000 to 75,000. After a kiln is filled a slow fire is started and maintained for a couple of days; this is done so that such moisture as remains in the brick will be gradually driven off. I did not understand how brick that had been permitted to remain, say two or three days, on a steam-heated floor could contain any moisture, but I was told that under the most favorable conditions only a portion of the moisture of absorption would be driven off while the brick were on the dry floor and, in addition to this, the clay contained from eight per cent to ten per cent water of crystallization, which could not be driven off until the higher temperatures are reached. Should the kiln burners permit the too rapid heating of the kilns this moisture would be converted into steam, the brick would lose their shape and become a conglomerate mass. After the moisture is driven completely off the fires are then increased until a sufficient temperature is obtained throughout the kiln to thoroughly burn the brick. The Mount Savage clays, I was informed, are of a most refractory nature, hence it is necessary to burn them at temperatures much higher than those necessary to burn the average high grade fire brick. It usually requires six days to burn a kiln of brick and about three to four days to cool them, so in about ten days from the time the brick are placed in the kilns they are ready for shipment.

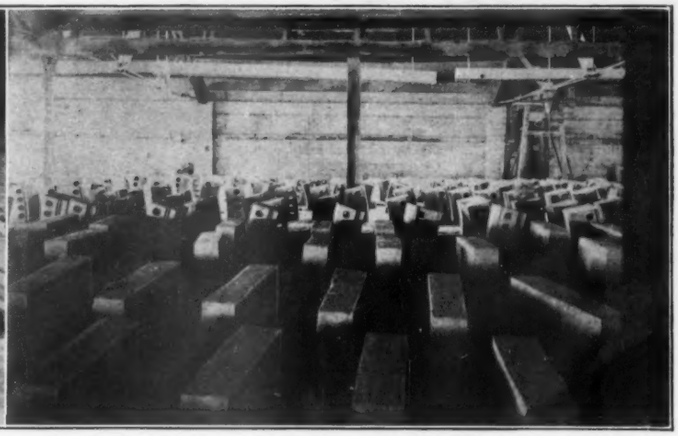
This was during the recent dull times and I was much surprised to see them working both "yards" to their full capacity and still reducing the stock in their sheds.

Speaking of stock in sheds—one is surprised at the number of brick of different kinds on hand. I was assured, however, that it was a long-fixed policy to endeavor to anticipate the customer's requirements, and that the aim was "prompt shipment at all times"; consequently the big stock, I was assured, is not above the average constantly carried.

STOCK OF FIRE CLAY CARRIED AT MT. SAVAGE.

STOCK OF KILN AND FURNACE LINERS.

THE DRYING PROCESS BEFORE BURNING.



SPECIAL SHAPES ON THE DRYING FLOOR.

When the superintendent undertook to tell me of the many different lines of trade to which the company cater and the different characteristics of brick required, from a manufacturing standpoint, I could readily see how such an assortment could mean a big lot of brick on hand and, at the same time, not have many for any particular line of trade. For instance, they have their blast furnace following, hot blast stoves, rolling mills, furnace roof brick, heat zone of lime kilns, friction zone of same, water-gas checker brick and special shapes for water-gas machines, and many more. Each particular industry must be carefully studied, its conditions and requirements considered, and brick made to withstand such heats specifically. This is accomplished by manipulating the clays, in the grinding, screening, mixing and ageing.

One can readily appreciate why fire brick manufacturers who cater to special industries, as the Union Mining Company does, should continue operating their plant to capacity during times like the present, and after my visit to Mount Savage I shall, like many of the lime manufacturers, consider as old friends the "Mount Savage" and "Refracto" bricks. Among other things there was a large storage shed, with a capacity of about half a million brick, which was devoted exclusively to railroad tile.

Aside from their fire brick operations the Union Mining Company sell large quantities of their "Mount Savage" clay, shipping same in car lots or less—in bulk, sacks or barrels. There is a great demand for this clay in and around iron and steel works; also for use in "setting" linings of furnaces, kilns, stacks, etc. The clay is ground exceedingly fine and passed over a screen, through a chute, and into railroad cars. This obviates the necessity of handling and prevents foreign matter from getting into the clay.

Attention was called to the new modern automatic track scales, recently installed. With these all complaints as to short weight is practically done away with. The scales register the actual tare weight of the car, and then the amount to be loaded is added to the tare and the "beam" set accordingly. When this amount is in the car the scales register again automatically on a card, which is held as a permanent record.

The company has, besides the one at Mount Savage, sales offices in Baltimore and Pittsburg, and selling agencies in practically every city of any size in the United States and Canada. Their "Mount Savage" is the oldest brand of fire brick in this country, its manufacture having been begun in 1841, and it is most favorably known from Maine to Texas, from the Atlantic to the Pacific, in Mexico, South America, Cuba and far away Japan.

The Union Mining Company, as stated previously, is also engaged in the mining of coal. I at once thought of the little holes in the ground often seen near coal-using industries, where sufficient coal is taken to run the plant. Naturally I was surprised when I was told the company operated three large mines, with a combined capacity of about 3,000 tons per day. The coal mined is from the celebrated big vein of the Georges Creek region, which is considered the standard of the country for stear and smithing purposes, also for brick and pottery burning. This particular vein, or seam, is to be found only in Allegany County, Maryland—like the celebrated vein of "Mount Savage" clay. There are found in Pennsylvania and West Virginia what are often claimed to be the same veins of coal and clay, but nowhere has either coal or clay been found of such high grade as that in Allegany County, Maryland. It goes without saying from this description that the Union Mining Company is independent at all times of market conditions to insure a fuel supply for their brick plant, their coal mines being within five miles of the brick operations.

Charles H. Claiborne, the popular general sales agent of the company, who keeps his office in the Fidelity Building, Baltimore, when he is not attending to our readers' fire brick needs, can tell this all a lot better than the writer, because he knows how all the way.

Clays in Florida.

The valuable deposits of clay that are found so widely distributed in northern and central Florida have to the present time received little use except in the manufacture of common building brick. They are, however, well suited to a variety of purposes, and some front and fire brick, red earthenware, tile and pottery have been produced.

The brickmaking industry of the State is most active near the large centers of population, where the demand for the product is good. About twenty-seven factories are in operation in thirteen counties. The factories are most numerous near the northern line of the State, because the clays are there most abundant.

In addition to the supply necessary to meet the home demand, considerable clay is mined in Florida and shipped to some of the Northern States, where it is sold under the name of ball clay and used for the manufacture of pottery. A plant for the manufacture of pottery from this clay, which is mined in Putnam and Lake Counties, has recently been established at Jacksonville.

Practically all the clays which are now used for brick and tile manufacture in Florida burn to a bright red or yellow color at comparatively low temperatures. However, the products of some of the kilns show every gradation in color from light buff to nearly black, the variations being usually due to imperfect oxidation of the iron compounds present, the lighter colors resulting from burning at too low a temperature and the darker from lack of sufficient air to furnish oxygen. When clays containing both lime and iron are properly burned a buff color may result.

Some brief notes on the geology of the Florida clays, by George C. Matson, of the United States Geological Survey, have just been published by the Survey in an advance chapter from Bulletin 380 (380-K), which forms Part 1 of "Contributions to Economic Geology, 1908." This chapter, which contains also lists of the Survey publications relating to clays, fuller's earth, lime and magnesite, gypsum and plasters, glass sand, abrasives, mineral paint, and phosphates, will be sent free of charge to anyone making application to the director, United States Geological Survey, Washington, D. C.

New Incorporations.

The Northern Brick Company, Crescent, N. Y., for the purpose of manufacturing brick and building material; capital $6,000. Incorporators are C. T. Allison, W. Brunswick, G. Sloane, E. L. Allison.

The United States Clay Company, of Indianapolis, Ind., filed articles of incorporation with the Secretary of State for a company which is organized to manufacture and deal in clay products. The concern is capitalized at $2,500, with the following incorporators: John R. R. Lindner, Edwin P. Phillips, Francis M. Dugger, Walter T. Brown and Samuel W. Keene.

The Burnham Brothers' Brick Company, Milwaukee, Wis., incorporated with a capital of $300,000. Those interested are J. A. Burnham, G. E. Burnham, C. L. Burnham.

Lafland Brick Company, Milton, Del., capital $50,000. Incorporators are H. M. Joseph, C. H. Dardson, A. H. Lafland.

The Longmont Brick and Tile Company, Longmont, Colo., was organized with the following directors: W. M. Stewardson, C. W. Stewardson, A. H. Gunning, T. M. Callahan and J. W. Paxton. The company is capitalized for $25,000, all stock having been subscribed.

Osnaburg Brick Company, Canton, O., with a capital of $25,000; the incorporators are E. A. Stewart, A. Smith, H. Dall, G. E. Smith.

Cope, Carr & McClaskey Brick Company, Chester, Pa., with a capitalization of $30,000. Mrs. William Cope is the senior member of the firm.

The Refractory Firebrick Company, Dover, Del., with a capital stock of $350,000; incorporators are J. L. Cohagan, E. L. Squire, G. W. Dorsey.

Northern Brick and Tile Company, Sault Saint Marie, Mich., with capital of $50,000 and capacity of 25,000 brick per day. M. Van Orden, J. J. Byers, W. A. Bateman, C. E. L. Thomas, E. A. Reavie are the officers of the new company.

Washington Brick Company, New York, capitalized at $500,000, for the manufacture of composite stone, brick, etc.; incorporators A. H. Jackson, R. A. Osborn, W. W. Mumford.

The Dunn Wire-Cut Lug Brick Company, Conneaut, O., capitalized at $75,000 by Frank B. Dunn and others.

Articles of incorporation were filed in the recorder's office at Kansas City by the Missouri Shale Brick Company. The capital is $75,000, half paid up. As incorporators are named the following, all of Kansas City: F. C. Kaempff, O. L. Kaempff, Hos. S. Waler.

The Fremont Tile and Brick Manufacturing Company, Fremont, O., by Alvin A. Nichols and others; $20,000 capital.

The Vulcan Fire Brick Company, Baltimore, Md., capital $200,000; C. C. Chevalier, W. T. Stilwell, J. P. Tulley are the incorporators.

The New Brick Company, of Grand Rapids, Mich., has filed articles of incorporation with a capitalization of $30,000. Those interested are John Veneklasen, of Zeeland; J. L. Van Valkenburg and McGeorge Bundy, of Grand Rapids. The purpose is to manufacture and sell brick, tile, cement and lime and deal in coal and wood.

The largest contract for high-grade front brick ever awarded to a Philadelphia concern or for Philadelphia use has just been placed with S. B. Dobbs, 1218 Chestnut Street, Philadelphia, for the light gray impervious brick, to be used for the interior of the immense office and publishing house to be erected on the entire block between Walnut and Sansom and Sixth and Seventh Streets, Philadelphia, for the Curtis Publishing Company. The order comprises two and a quarter million high-grade front brick manufactured by the Harbison-Walker Refs. Company, Templeton, Pa., of which Mr. Dobbs is sole selling agent. These brick are of a very light delicate color, and are absolutely impervious to moisture. In preparing the plans, Architect Edgar V. Seeler has eliminated the use of plaster altogether, and adopted these impervious brick, which are not only non-absorbent and sanitary in every respect, but assist greatly in lighting the immense building, and make a very attractive interior finish.

Chicago's Activity.

(Continued from page 25)

the wagon haul of cement to not more than three miles in the most extreme cases.

What is known as their West Side warehouse and the one which Chas. J. Reid, who has charge of the warehouses of this firm, calls the most modern and a model of its kind for the purpose it was constructed, is located on the Belt Line at Forty-sixth Avenue and Indiana Street. It has a siding or private switch track on its own grounds, so no interference need be feared from the railroad should it contemplate any construction work. The building is one story in height, easy of access to both teams and cars, long and narrow, which makes the handling of the large number of bags of cement an easy matter. The cars on the siding run up close to the warehouse door, making the unloading of the car an easy matter. Should the carload of cement not want to be placed or stored in the warehouse, but taken direct from the car by teams for delivery there is a team track on the other side of the car and the unloading from the car to the wagons is quickly and expeditiously accomplished. A well built and spacious barn for horses is located near the warehouse on the same grounds, as well as shelter sheds for teams and wagons used in the delivery of the cement sold. The storage capacity of this West Side warehouse is large and ample for the demands made upon it by the district in which it is located. The storage capacity of all the warehouses of this firm is estimated by Mr. Reid to be about 40,000 barrels of cement. The principal brands this firm carries is Utica Hydraulic cement, Lehigh and Marquette Portland cements and the Blanc Stainless cement.

"When an order comes into the main office for cement," said Mr. Reid, "few people have an idea of the detail involved from that time to the time when it is delivered on the job. This is the procedure: We will say the order is received by telephone at the main office. From there it is sent to the warehouse serving the district where the delivery is to be made. The foreman of that warehouse makes a memorandum for order on a slip, then makes a ticket on an autograph register machine, which makes three copies at one writing, each ticket being numbered. One ticket is left on the job and returned by the foreman to be forwarded to the contractor's main office, so he can check the invoice when received. Each ticket number appears on the invoice, and each invoice number appears on the contractor's monthly statement. The second ticket is signed by the timekeeper on the job and returned to the warehouse and from there to the main office, where it is checked, charged and filed for future reference. The third ticket goes immediately to the main office, as the original evidence of the transaction. The load is then sent out by the teamster and a report is made on a daily report in carbon duplicate and entered into the stock book, which in itself is on the same principle as a ledger. This ledger or stock book is balanced every night, and this balance must agree with the stock on hand and the book in the main office, where a record is kept of all the receipts and deliveries."

"The trials and tribulations of the dealer in cement are without number," continued Mr. Reid, "but among the meanest is the problem which may never be solved, namely, the empty bag proposition. It is the curse of the cement business. It is in the nature of discrepancies in accounts caused by the comparative condition of empty bags. The empty bag is often looked upon as nobody's property, and invariably abused by everybody. They are allowed to be used for almost any old thing on the job, such as the wrapping of ropes to keep them from cutting, covering of pipes that are leaking, protection of completed work from the weather and using them as a tarpaulin in general or allowing them to get into the mud or to get wet. Also in rough handling and cutting with shovels when the foreman's back is turned, which makes them unfit for further use as cement bags, and consequently rejected for any of these causes by the mill when the dealer returns them for credit. The dealer tries to cull out the bag he considers no good, and the bags he accepts as good ones are in many instances rejected by the mill.

"Each one of the dealers' teamsters carries a bag receipt book and on small lots counts the bags and gives the timekeeper a receipt for the same. On large lots, where the bags are put up in packages or bundles, he gives them a receipt for so many packages or bundles, subject to the inspection and count at the warehouse. The discrepancy in the count of the bags running both under and over what each package should contain is surprising.

"There is a careful count and record kept at each warehouse, in fact there is a double count made on each lot and reported to the office each day, where they are entered on a monthly bag credit memorandum, where they are itemized, the date of their return, location of the job they are returned from, the teamster that brought them back, the number of bundles, the number of good bags credited, the number of worthless bags and the number of foreign bags not credited. At the end of the month the total number of good bags returned during the month are credited to his account. One copy of this memorandum is sent to the contractor and the other retained in the office for future reference. These bags have to be returned to the respective mills by the dealer freight prepaid, and all bags not rejected the mills give the dealer credit, as the mill charged them to the dealer when he purchased the cement.

"Another item of expense to the dealer is the testing of the cement he sells to the contractor who does city work and other large work, which necessitates double handling and storage and oftentimes runs two months and more on certain lots owing to delays and weather conditions, which involves space in the warehouse and insurance amounting to a good deal of money during the year.

"There were 300,000 barrels of cement used and tested by the city alone last year, which, of course, was taken from all the different dealers in the city. Then there are other tests for large work where the material has to be held in storage the same as that used by the city."

The Wisconsin Lime and Cement Co.

The Wisconsin Lime and Cement Company's general offices and exhibit room are on the sixth floor of the Chamber of Commerce Building. This firm deals in and manufactures masons' and plasterers' material. This firm has yards located at 6329 Wentworth Avenue, at Loomis and Fifteenth Place, at the west end Erie Street bridge, at 2056 West North Avenue, at Forty-fifth Court and Gladys Avenue, at Oakdale Avenue and West Ravenswood Park and at 522 Devon Avenue. It can be seen at a glance that these locations of yards fully cover every division of the city, and that material delivered to any job in any part of the city makes the haul by team comparatively a short one, it being estimated by E. K. Carmack, the vice-president of the concern, that the longest haul from any of these yards to any job in the district where the yard is located cannot be greater than three miles. This saves time and insures prompt delivery. All of these yards have rail connections. Every pound of lime is shipped from Wisconsin in cars in bulk and taken from the cars and hauled by teams direct to the job, no lime being stored in any warehouse in its yards in Chicago. Some twelve carloads of lime in bulk are shipped daily over the St. Paul, Great Western and Northwestern roads to the different yards.

The yard at 6329 Wentworth Avenue is on the Rock Island Railroad, its track being about 150 feet from the warehouse in the yard, where some 4,000 bags of Universal, Peerless and Atlas Portland cements are constantly stored in tiers of twelve bags to a tier and many thousand bags of plaster ten bags in a tier. A large amount of common cement is also handled at this warehouse, two bags to the barrel.

Wm. J. Lesser, the superintendent, young, active and energetic, said that they handled in large quantities flues, linings, fire brick, wall coping and building brick, which are stored in sheds in the yard. The common brick, which is shipped to them over the Chicago and Eastern Illinois Railway, is delivered to the jobs direct from the cars on the track by team, saving double handling by not passing through the yard. Of the cement handled at this point fully eighty per cent does not go into the warehouse, as it is loaded into wagons from the cars on the track and hauled to its respective jobs. He made the statement that there is never any demurrage on cars that remain on the track loaded with cement to be delivered in the city by team direct to the jobs. This speaks volumes for the perfect system and quick handling of material. This firm manufactures its own common brick and lime and is the selling agent for the plaster of the United States Gypsum Company. Mr. Leiser said that to handle promptly and economically the different materials in this yard he employed twenty-five men and fifteen teams. In all their yards they use 250 horses and 125 wagons.

The Chicago Contractors' Supply Co.

The Chicago Contractors' Supply Company has its main offices in the Chamber of Commerce. This concern has four yards from which they deliver the material they handle to the jobs in the city. They are located at Fifty-eighth and Loomis, Sixty-fourth and State, Twenty-second and Cottage Grove and Fortieth Avenue and Taylor, all on railroad lines. The large number of carloads of rubblestone shipped to their Fifty-eighth and Loomis yards comes from Joliet on gondola cars in bulk and teamed over the scales direct to the job.

It is on the Panhandle track with a Y and straight track running through it, passing right along at the warehouse and bins in the yard. Lump lime is handled from cars direct with very little exception. Cement, prepared plaster and stucco are handled in large quantities. Some lath is piled in the open in the yard and some is stored under roof, because one contractor will prefer dry lath while another prefers wet lath.

O. Lockett, Jr., the secretary and treasurer, said that it required about fifty teams to do the hauling of the material they handle. He spoke of the plaster mortar made by machinery. "It consists," he said, "simply in lime mortar mixed by measurement and not by guesswork, and is mixed entirely by machinery. We are the only ones making it in Chicago, and we sell large quantities of it. Our mill is at the Fifty-eighth Street yard. The beauty of that plaster lies in the fact that we are able to guarantee that it will not pop in the wall, it spreads easier, is easier for the men to work and costs less than hand made lime mortar. It dries very quickly, enabling the plasterer to finish up a job quicker than can be done otherwise. It sets hard and smooth, and when the finish has been put on it makes a pretty job. Although we only commenced making this plaster six months ago it has become very popular."

F. Schultz

F. Schultz's yard and office are located at 159 West Sixteenth Street near the Chicago, Burlington and Quincy tracks, and close to the Northwestern and St. Paul roads. His yard is 75'x100' and his warehouse 100'x20'. Its narrow width makes the handling of cement and lime exceedingly economical and convenient. Bags of cement he frequently piles fifteen to twenty bags high, which almost reach to the ceiling. The leading brands he carries are the Atlas, Chicago A. A., Bedford and Universal Portland cements, and Louisville Natural cement. Lime he receives mostly from Wisconsin, which he handles direct from the cars to the job. The capacity of his warehouse is a little over 3,000 barrels.

He stables in his barn ten horses and uses on an average six teams to do his hauling.

J. J. Croake Company

The J. J. Croake Company's yard and office are located at 620 to 628 West Fullerton Avenue, a quarter of a mile from the Chicago, Milwaukee and St. Paul Railroad. Their storage capacity is about 3,000 barrels cement. The leading brands they handle are the Chicago A. A., Medusa, Atlas, Hecla and Peerless Portland cements. They handle during the year over twenty thousand barrels of cement, seventy-five per cent of this they use themselves in the manufacture of concrete building blocks, sewer covers, chimney blocks and general construction work. The cement the firm sells and delivers is within a radius of one and one-half miles of its yard.

P. T. Britt, the manager, said: "Our business in concrete building blocks, which we manufacture, is large, the output being 1,000 per day of all kinds of blocks, ninety per cent we set ourselves. We employ some fifteen teams and use twelve horses of our own. The estimate of the number of barrels of cement we handle I gave is conservative."

James E. Lill

James E. Lill has his office and yard at 1225 Bryn Mawr Avenue, Edgewater, on the Chicago, Milwaukee and St. Paul Railroad. He owns a switch track 430 feet in length, which runs on the east side of the yard alongside the warehouse, with a team track on the east side of it, where cars are unloaded on teams and material hauled to jobs direct. A roadway runs through the yard, where teams are loaded with lath, fire brick, wall coping and other material piled in the open on either side. There are three and one-half million of lath piled up in the yard and Mr. Lill said he handled about eighteen million during the year.

In his warehouse he stores cement, the leading brands he handles being the Marquette and Universal Portland cements, and the lines of plasters made by the United States Gypsum Company. On the second floor of the warehouse he keeps metal lath, hair, fiber corner heads and other specialties. Adjoining the warehouse the barn is located, where he stables sixteen horses. He employs some twenty teams, twelve of which he hires. The territory in which he sells and delivers material covers the entire North Side of Chicago, going as far north as Wilmette and west to Lawndale. Some of his hauls are six miles, but cannot make use of cars, as the delivery is too uncertain. Seventy-five per cent of all the material he handles is done direct from the cars and does not go through the yard. Lime is all handled direct from the cars to the job. His lime boxes (looking like little houses on wheels), which he furnishes to contractors on the jobs, are water tight and conspicuous for their neat appearance, being all painted a bright yellow. These boxes are a great convenience to the contractor, as well as to the dealer, the purpose being to expedite delivery, because in bad weather if no box were on the job to put lime into the teams would be obliged to return with the load. Mr. Lill said that

he expects to erect a new warehouse at the northeast end of the yard beside his switch track, with a storage capacity of 10,000 barrels of cement, as his present warehouse is inadequate for the needs of the business. There practically is no trucking, everything being compact and convenient for unloading and hauling the material he handles.

The Tuthill Building Material Company.

The Tuthill Building Material Company has its main office, yard and warehouse at 229 to 233 West Sixty-third Street, on the Rock Island Railroad, with a switch track running alongside the warehouse, from where the material in the cars is unloaded and placed in the warehouse on the second floor, which is level with the track. A novel feature in this connection is the handling of crushed stone. It is dumped from the cars into a pit underneath the track. An elevator to the second floor takes the crushed stone from the pit in buckets, where bins are located for storing it. These bins have a capacity of thirty carloads. Dumping the stone from the cars is practically instantaneous and filling the bins by means of the elevator is purely mechanical. Wagons are driven under the bins on a driveway in the warehouse on the ground floor, level with the street, a gate in the bottom of the bins is opened and the wagon loaded in a jiffy, which is then weighed and taken to the job. For swiftness and economy in handling crushed stone this arrangement and method has no equal.

A unique feature was also observed in the handling of cement, the leading brands being Chicago A. A., Atlas, Peninsular and Peerless Portland cements, which are all shipped in bags and stored on the second floor, which has a capacity of about 15,000 barrels. When cement is sent out by team to the job the wagon to be loaded is driven on the driveway in the warehouse on the floor beneath which is on the street level. Chutes are then run through openings on the floor above to the wagon waiting for its load, and the bags of cement slide down into the wagon in less time than it takes to tell it. Some 150 tons of plaster of the United States Gypsum Company are constantly stored on the second floor and handled in the same manner as the cement. Merchandise, fire brick and fire clay are carried to the third floor by freight elevators.

The yard is located on both sides of the Rock Island tracks, with a team track running through the center, affording easy handling in loading teams with material piled up on either side in the open, which needs no protection from the weather. For instance, such as lath, an enormous quantity of which is very much in evidence there.

On the second and third floors in the L wing of the warehouse sixty horses are stabled, while the stable contains seventy-five stalls, which probably will be occupied in a short time, as the hauling of material is increasing rapidly. J. B. Tuthill, the president of this company, spoke of the West Side yard, which is located on the Belt Line at Forty-seventh and Howard Streets, with a switch track running through the yard. A large warehouse much needed will be erected there in course of a month, which will give that yard the same capacity as the South Side yard and will then be able to cover the territory on the West Side, as the yard at Sixty-third Street is covering the territory of the South Side.

The Wm. E. Dee Company.

The Wm. E. Dee Company has offices in the Royal Insurance Building, on the second floor. It manufactures sewer pipe and drain tile at its works, located at Mecca and Newport, Ind., and has eight yards distributed in each division of the city, Auburn Park and South Chicago. All these yards with the exception of their downtown yard at Quincy Street are on a railroad line, with a private switch track owned by this company, and which run alongside the warehouses in all of these yards, conveniently located for the unloading of cars.

The leading brands of cement stored in the warehouses are the Chicago A. A., Atlas and Utica. Mr. Dee stated that they handled about 100,000 barrels of cement yearly. Twenty-five per cent of this cement is not handled through the warehouses, but shipped direct from the mills to the purchaser or job.

They have barns at each yard, where the horses are housed and taken care of. The sewer pipe and drain tile they handle is their own manufacture—the Diamond D Mecca sewer pipe. The company estimates it receives about 3,000 carloads of material in a year at its different yards. It employs forty teams to do the hauling. The total output of sewer pipe and drain tile of its works at Mecca and Newport sixty per cent is sold in Chicago and thirty per cent is shipped direct by rail to its final destination or job.

A foundry and machine shop for repairing and manufacturing cast iron manholes, catch basin covers, gutter curbs and sidewalk rings and sewerage castings of all descriptions is operated by this company. The foundry is located in Chicago and has a capacity of 15,000 pounds finished castings per day.

This concern maintains a general superintendent of all yards, whose duty it is to keep up the efficiency in the yards. Each yard has its local superintendent, who reports to the general superintendent. Each yard employs a salesman and collector, whose duties lie in the district in which the yard is located. These salesmen and collectors report to the general superintendent.

By this system every detail in all the yards comes under the personal observation of the general superintendent, who makes his report to the main office. In this way every detail and method is constantly watched and the efficiency of handling the vast quantity of material is always at its best.

The Garden City Sand Company.

The Garden City Sand Company's main offices are in the Chamber of Commerce Building. This concern makes the popular and well-known Stonekote and block facing plasters at its principal yard, located at Throop and Lumber Streets and on the banks of the Sampson Canal. These plasters are for exterior finish, and it also makes a rough cast plaster, all of which run in various colors; also a plaster for interior finish for wire and metal lath.

The warehouse in this yard handles exclusively the plasters and keeps in storage from 600 to 700 barrels. In addition to its own plaster it handles the Newark XXX plaster of Calvin Tompkins Company, which is shipped here mostly by water. It handles fire brick of the Kentucky Fire Brick Company and several other brands.

The cement handled by this concern, the leading brands are the Bedford, Atlas, Huron and Edison.

The only plaster handled in barrels is the Newark plaster; all other plaster is handled in bags. From 6,000 to 7,000 bags of raw material for plaster is kept in store and from 10,000 to 12,000 bags of cement. During the summer months, however, the storage is much higher, as a boat coming up the Sampson Canal lands a cargo of 50,000 bags of material at the yard.

John Augstein, the superintendent of this yard, pointing to tier upon tier of bags, fifteen to each tier in the warehouse, said "that all this material remains in storage but a comparatively short time, as twelve teams and five single wagons are daily kept busy hauling these bags to the different jobs in the territory of the yard. Then much of this material was taken from the warehouse in cars and transferred to the various lines of roads for its final destination. Economy in handling all material, we watch closely and effect it, as this yard has great advantages of location. For instance, unloading material either from boat or cars, the distance of trucking is exceedingly short, as the Q tracks run beside the warehouse, and the boat landing is but seventy-five feet from the warehouse.

With the large quantity of material handled here a great deal of expense is saved in the handling alone of brick, which costs 50 cents a thousand from cars on track into the warehouse, and three-fourths of a cent on a bag of cement or three cents a barrel. Delivery charges by team from the warehouse to the job are twelve cents a barrel for the first mile and two cents for each additional mile. The charges for delivering brick are $2.25 for the first mile and 25 cents for each additional mile. "When you consider that there is kept in stock 150,000 brick constantly, and that sixteen men outside of teamsters are employed in this yard it is essential to practice the utmost economy, as the margin of profit on plaster cement and brick is very narrow. The same conditions obtain handling material in the other five yards of the Garden City Sand Company, all having rail connections."

The Chicago Fire Brick Company.

The six yards with their warehouses and sheds located each one on one of the lines of railroad coming into Chicago and scattered over the three divisions of the city it seems are not sufficient to handle the great volume of business of the Chicago Fire Brick Company, whose main offices are in the Chamber of Commerce Building. They have now in contemplation starting two more yards within a few months.

One of the principal yards of this company is located at Archer Avenue and Wood Street, on the Chicago and Alton Railroad, with a switch running through the center the entire length of the yard, making unloading of cars in any part of the yard absolutely without truckage an admirable feature in saving time handling material.

John McBride, its superintendent, said that this warehouse had a storage capacity of 25,000 barrels of cement and plaster. This large warehouse, where cement is stored, has team tracks on three sides and on the fourth side fronting north runs the railroad track. It has four large sliding doors for loading teams for outgoing material and like accommodations for unloading cars. West of this warehouse stands a shed for the storing of fire brick, fire clay, etc., which is 170 feet long and sixty feet wide, with a team track surrounding it and the railroad track running alongside. A new shed is in process of construction, which will be 100 feet long and sixty feet wide. This shed will be used for the storage of fire clay and molding sand. Its capacity will be fifty carloads. A two-story barn is located at the northeast end of the yard, where twenty horses are housed and fed. The entire equipment and arrangements in this yard for the handling of materials have been made solely with but one object in view, viz., doing away with as much truckage as far as possible, and economical methods in general. Wherever it is possible material hauled to the jobs is handled directly from cars.

Sewer pipe, fireproof tile and fittings are stored in the yard in the open, with a team track running between the piles of this material.

The principal brands of cement this yard handles and stores are the Chicago A. A., the Newaygo, Ætna, Peerless and Utica. They also carry a full line of fire brick.

M. A. Staley Company.

M. A. Staley Company's office and yard are located at 1230 Cornelia Avenue. It is exceedingly convenient for the distribution of material in that section of the city. It is on the Chicago, Milwaukee and St. Paul Railway, with a switch owned by the firm running alongside the entire length of the yard and close to the warehouse, where cement and plaster are stored, making the unloading of cars of material into the warehouse an easy task without trucking. A roadway between the switch and the warehouse is used for loading direct from the cars and hauled to jobs.

All the lime the firm receives comes from Wisconsin, made by the Milwaukee Falls Lime Company, and goes direct from the cars to the job, none being stored at any time. The capacity of its cement warehouse is a little over 2,000 barrels. Chicago A. A., Owl and Wabash are the principal brands handled. "Climax" wall plaster is handled quite extensively. No trucking is required putting these materials into and taking them out of the warehouse, where also hair and fiber and stucco are stored. In the yard are stored fire brick, white brick, wall coping, flue lining, sewer pipe and fittings and the drain tile made by the Chicago Fire Brick Company. A driveway through the yard with these material piled on either side makes their handling by team a quick and economical matter. The stable is located on the ground floor of the warehouse, providing for twenty horses. It requires eight teams to do the hauling for this yard. Seventy-five per cent of all the material the firm handles is delivered direct from the cars. Its Jefferson Park yard, located on the Chicago and Northwestern Railway, with a private switch, has practically the same capacity as this yard.

N. J. Druecker & Company.

N. J. Druecker & Company's office and yard is at 1499 North Artesian Avenue, on the Wisconsin division of the Chicago and Northwestern Railway, with a private switch running along and close to the warehouse. The warehouse has a frontage of sixty feet on the switch and is ninety-one feet long. Adjoining the warehouse is the barn, where they stable eleven horses. It requires four double and one single wagon to do the hauling of the material of this yard, which is distributed by team to all parts of Chicago.

Their warehouse has a capacity of 6,000 barrels of cement and plaster. The leading brands of cement they handle are Universal, Ætna and Atlas Portland cements and Louisville Natural cement. The wall plaster they keep in store is Hovey's gypsum of Grand Rapids and the Crystal brand made by the Michigan Plaster Company. The only material they store in the yard in the open is lath, wall coping and flue lining. Fire brick and fire clay is stored under sheds. All the lime they receive is from Wm. J. Druecker in Wisconsin, and is handled direct from the car to the job. The driveway runs at right angles through the yard from Artesian Avenue to the switch track at the warehouse, and in consequence the cement and plaster in the warehouse are as convenient and easy to load on the wagons as the material in the yard. All their arrangements for handling material are exceedingly economical and practical, which have been developed by long experience in the supply business.

Henry Frerk.

The location of Henry Frerk's yard and office is at 452 to 484 West Belmont Avenue, on the Chicago and Northwestern Railroad. A switch track owned by him is run along the entire length on the south side of the yard and close to the warehouse, for unloading cement and lime. The warehouse is a large

one, divided by a driveway, which runs through the yard. The section on one side of this driveway in the warehouse is devoted to the storing of hay and other material, while the section on the other side of the driveway is devoted to the storing of cement. The section where the cement is stored is twenty feet wide and has a capacity of 2,000 barrels, Marquette being handled exclusively. Doors from this section of the warehouse open on the switch track and doors open on the driveway in the warehouse for the loading of teams hauling cement to the jobs.

All lime they receive over the Chicago and Northwestern from Wisconsin, which is handled direct from the cars to the jobs. The only exception to this method of handling lime is when they receive more lime some days than there is demand they store it in bins in the warehouse, where it is never kept longer than one or two days. In hot weather this arrangement saves sometimes much lime from spoiling.

There are two large bins in the warehouse, with a capacity of 500 barrels of lime each. The bins are constructed on the same principle as refrigerators, being air tight, and its walls, ceilings and floors having interior air chambers and filled with slacked lime. They have a ventilation top, from which the air passes and circulates through the air chambers in the walls, ceilings and underneath the floors, keeping the temperature of the interior of the bins sufficiently cool to keep the lime stored within from slacking. Mr. Frerk handles a very large lot of lath, which is piled in the open yard. He has six teams, which he uses in delivering material, the hauls being as a rule within a radius of about three miles.

Purchase Cement Plant.

MORGANTOWN, W. VA., May 10.—A deal has been closed here whereby the Alpha Portland Cement Company became the owner of the Manheim, W. Va., plant of the Buckhorn Portland Cement Company. The price was $500,000. The purchasing company will spend $250,000 in improvements. The plant, which has been idle for several years, will be started up. When the improvements are completed it will have a capacity of 3,000 barrels a day.

Among the visitors to ROCK PRODUCT'S sanctum recently was J. L. Mitchell, president of the Eureka Stone & Ore Crushing Company of Cedar Rapids, Iowa. Mr. Mitchell is enthusiastic over the outlook for business and showed orders for his now well known crushers which will keep the factory going full time for a long period. Mr. Mitchell has made a study of the crusher man's wants and expects to launch on the market soon a new type of crusher designed especially to meet the wants of the cement manufacturer. He says that he will greatly reduce the cost of crushing raw materials.

L. V. Thayer, of Peerless Brick Machine fame, blew into Chicago last month, but as usual had only a few minutes to spare. Mr. Thayer has one of the best propositions in the cement business and the business just naturally hunts him up. No man ever enters the cement brick business without considering the Peerless Brick machine, better known as the one-man machine that can make twelve thousand perfect bricks per day.

Mr. Thayer has sold more machines so far this year than in any previous year and attributes a great many of his sales to the new tamping device, which is found on no other machine.

Sam Wright, the general manager of the Atlas Car and Manufacturing Co., whose main office is in Cleveland, was a recent Chicago visitor. Mr. Wright was here on business and had several busy sessions with Manager Williams at their local office. He reports business looking up in his section and says that conditions are rounding to nicely.

The Ernst Wiener Company, New York City, manufacturers of industrial cars and track, have appointed the W. K. Kenly Company, of Chicago, as their district sales agents.

CLASSIFIED ADVERTISEMENTS

Advertisements will be inserted in this section at the following rates:

For one insertion .....25 cents a line
For two insertions .....45 cents a line
For three insertions .....60 cents a line

Eight words of ordinary length make one line.
Heading counts as two lines.
No display except the headings can be admitted.

Remittances should accompany the order. No extra charges for copies of paper containing the advertisement.

EMPLOYEES WANTED

WANTED.

If you are in need of or wish to sell anything which comes under any of these classifications, write us. If you have something not coming under these classifications we will create one for you.

WANTED.

A first class, experienced traveling Portland cement salesman. No beginners or parties handling other lines need apply. Give references, and salary expected. Travel out Kansas City. Western territory. Address Box 700, care ROCK PRODUCTS.

WANTED.

A competent, experienced superintendent for an up-to-date, finely equipped sand-lime brick plant. Address, stating age and experience,
J. R. C., care ROCK PRODUCTS.

EMPLOYMENT WANTED

WANTED—POSITION

as superintendent of stone crushing plant or concrete plain and reinforced. Address,
BOX 705, care ROCK PRODUCTS.

WANTED—POSITION

by engineer of 25 years' experience in construction and operation of stone crushing plants; familiar with all the details of the business; references. Address
BOX 703, care ROCK PRODUCTS.

POSITION WANTED.

Mechanical engineer, specialist for sand-lime-brick plants with fourteen years' experience in Germany and the United States; graduate of the College of Technology of Neustadt, Germany, wants position. Has built and successfully managed sand-lime-brick plants in both countries and can give references. Address W. F. S., Box 701, care ROCK PRODUCTS.

MACHINERY FOR SALE

CRUSHER FOR SALE.

Gates No. 4 Gyratory, in fine condition. Cheap. R. P., BOX 2, Sta. A., Cincinnati, O.

ENGINES AND BOILERS FOR SALE.

Engines—Corliss, Automatic and Throttling, all sizes from 1 to 500 H. P.

Boilers—Horizontal, Portable and Vertical, all sizes from 1 to 200 H. P.

Pumps, Heaters, Tanks, Sawmill and General Machinery.

Write for our prices on your requirements.

THE RANDLE MACHINERY CO.,
1745 Powers St., Cincinnati, O.

FOR SALE.

The following articles, but little used, are offered singly or together at low prices:

40 Lime hydrating boxes, 36 by 34 inches, 22 inches deep; 37-inch gauge.
1 Revolving Sand Drier, 42 inches in diameter, 24 feet long, complete with double cast-iron front, grates, driving gears and stack.
1 Pulverizer for hydrated lime.
1 Scale for hydrated lime.
1 13x16 75-horsepower Brownell engine.
2 Steel dump Cars, 24-inch gauge.
1 Car Puller. Address
SAVANNAH BRICK WORKS, Savannah, Ga.

CRUSHING OUTFIT FOR SALE.

For Sale—Entire crushing outfit in good condition and but slightly used; will sell intact, or will dismantle and load on cars as a whole or in part; one No. 12 "Acme" jaw crusher; one No. 9½ "Acme" jaw crusher; one No. 4 "Austin" gyratory crusher, and necessary accessories. Full details given upon application. Address, INDEPENDENT QUARRY CO.,
319 N. Holliday St., Baltimore, Md.

FOR SALE.

One 35 H. P. horizontal tubular boiler. Used but little. Removed to make room for a larger one. Hartford Insurance. Complete with all trimming, $125.00.
Address BOX 704, care ROCK PRODUCTS.

FOR SALE.

9 H. S. Palmer cement block machines.
1 Half yard self-dumping car.
1 Half yard Drake stationary concrete mixer.
Write D. J. KENNEDY CO.,
No. 6366 Frankstown Ave., Pittsburg, Pa.

BUSINESS OPPORTUNITIES

GYPSUM ROCK PLANT SITE.

If you are interested in a site for a gypsum rock plant write M. J. Skivington, of Mumford, N. Y.; he can interest you. Located near four railroads.

ROCK PRODUCTS.

Modern lime plant for sale, fine market, moderate competition, free water power, clean rock, work year around, patent kilns, oil fuel. Cash or terms. Address,
A. KNOWLES, 985 Folsom St.,
San Francisco, Cal.

PLANT FOR SALE

FOR SALE OR LEASE.

Allegheny quarries at Lancaster, Ohio. Splendid sandstone quarries fully equipped with six engines, air compressor, derricks, sand crushing plant, stone saw mill, ninety acres land, commissary and office, three residences, switching privileges with two railroads. Splendid market, only thirty miles from Columbus. Address McC. Martens or T. B. Cox, Jr., Lancaster, Ohio.

Index to Advertisements

CLASSIFIED BUSINESS DIRECTORY

BAGS.
Urschel Bates Valve Bag Co.
West Jersey Bag Co., The.

BALL MILLS.
Alsing, J. R., Eng. Co.
Power & Mining Mchy. Co.

BELTING.
Cleveland Belt & Machy. Co.
Chicago Belting Co.
Gandy Belting Co.
Main Belting Co.

BRICK.
Harbison-Walker Refractories Co.

BUCKETS, DUMPING AND GRAB.
Atlas Car & Mfg. Co.
Brown Hoisting Mac. Co.

BURIAL VAULTS MOLDS.
Ball & Brookshire.

BURR STONES.
Charles, J. M.

CEMENT BRICK MCHY.
Bartlett, C. O., & Snow Co.
Martin-Henry Brick Machine Mfg. Co.
McElroy Post & Pole Co.
Peerless Brick Machine Co.

CEMENT HYDRAULIC.
Carolina Portland Cement Co.
Chickamauga Cement Co.
Fowler & Pay.
Utica Hydraulic Cement Co.

CEMENT MCHY.
Alsing, J. R., Eng. Co.
Berg Mach. Mfg. C., Ltd., The.
Cummer, F. D., & Son Co.
Kent Mill Co.
Power & Mining Machy. Co.
Ruggles-Coles Eng. Co.

CEMENT, PORTLAND.
American Cement Co.
Alma Portland Cement Co.
Alpha Portland Cement Co.
Ash Grove Lime & Portland Cement Co.
Atlas Portland Cement Co.
Carolina Portland Cement Co.
Castalia Portland Cement Co.
Chicago Portland Cement Co.
De Smet, Geo. W.
Dexter Portland Cement Co.
Dixie Portland Cement Co.
French, Samuel H., & Co.
Goetz, Charles W., Lime & Cement Co.
Hartranft, Wm. G., Cement Co.
Ironton Portland Cement Co.
Kosmos Portland Cement Co.
Lehigh Portland Cement Co.
Marquette Cement Mfg. Co.
Meacham & Wright Co.
Maryland Portland Cement Co.
Northwestern States Portland Cement Co.
Oklahoma Port. Cement Co.
Omega Portland Cement Co.
Penn Allen Portland Cement Co.
Pennsylvania Cement Co.
Peninsular Portland Cement Co.
Sandusky Portland Cement Co.
Superior Portland Cement Co.
Union Sand & Material Co.
Universal Portland Cement Co.
United Kansas Portland Cement Co.
Warner, Chas., Co.
Western Lime & Cement Co.
Wolverine Portland Cement Co.
Woodville Lime & Cement Co.

CEMENT ROOFING MACHINERY.
American Cement Roofing Co.

CLAY PRODUCTS.
Buckeye Fire-Clay Co.
Western Lime & Cement Co.

CLAYWORKING MCHY.
American Clay Working Mchy. Co.
Bartlett, C. O., & Snow Co.
Berg Mach. Mfg. C., Ltd., The.
Cummer, F. D., & Son Co.

CONCRETE BLOCK MCHY.
Anchor Concrete Stone Co.
Besser Manufacturing Co.
Century Cement Mchy Co.
Concrete Stone & Sand Co.
Foote, J. B., Foundry Co.
McElroy Post & Pole Co.
Perfection Block Mchy. Co.
Pettyjohn, The, Co.
Simpson Cement Mold Co.

CONCRETE MIXERS.
Besser Manufacturing Co.
Kent Mach. Co.
Marsh Co., G. C.
Morehouse, N. J.
Svenson-Shuman Mach. Co.
Williams Contractors' Supply Co.

CONCRETE BEADS.
Carolina Portland Cement Co.

COLORINGS, BRICK AND MORTAR.
Chattanooga Paint Co.
Clinton Metallic Paint Co.
Ricketson Mineral Paint Works.
Williams, C. K., & Co.

CONCRETE REINFORCEMENTS.
American Steel & Wire Co.

CONTRACTORS' EQUIPMENTS.
The Pierce-Walton Co.

CONVEYORS.
Austin Mfg. Co.
Bartlett, C. O., & Snow Co.
Caldwell, H. W., & Sons Co.
Ersham, J. B., & Sons Mfg. Co.
Power & Mining Machy. Co.

CRUSHERS.
Alsing, J. R., Eng. Co.
Austin Mfg. Co.
Bacon, Earl C.
Bartlett, C. O., & Snow Co.
Butterworth & Lowe.
Chrome Steel Wks.
Ersham, J. B., & Sons Mfg. Co.
Eureka Stone & Ore Crusher Co.
The Good Roads Machy. Co.
Kent Mill Co.
Marsh Co., G. C.
Martin, Henry.
McDonnell Boiler & Iron Works.
Power & Mining Machy. Co.
T. L. Smith & Co.
Sturtevant Mill Co.
Taylor Iron & Steel Co.
Williams Contractors Supply Co.
Williams Pat. Crusher & Pulverizer Co.

CUT GEARS.
Nuttall, R. D., Co.

DRILLS.
Keystone Traction Drill Co.
Howell Mining Drill Co.
Williams Contractors Supply Co.

DRYERS.
Alsing, J. R., Eng. Co.
American Process Co.
Bartlett, C. O., & Snow Co.
Cummer, F. D., & Son Co.
Ruggles-Coles Eng. Co.

DRYER CARS.
Power Mining & Mch. Co.

DUMP CARS.
Atlas Car & Mfg. Co.
Austin Mfg. Co.
Continental Car & Equip. Co.
Power & Mining Machy. Co.
Sackett Screen & Chute Co., H. B.

DYNAMITE AND POWDER.
Aetna Powder Co.
Burton Powder Co.
DuPont Powder Co.
Illinois Powder Co.
Independent Powder Co.

ENGINEERS.
Bacon, Earl C.
J. C. Buckbee Co.
Fuller Eng. Co.
Spackman, Henry, Eng. Co.

EXPANSION BOLTS.
Farrington, H.

FIBRE MCHY.
Ohio Fibre Mch. Co.
Shuart-Fuller Mfg. Co.

FIRE BRICK.
Ashland Fire Brick Co.
Buckeye Fire-Clay Co.
Carolina Portland Cement Co.
Harbison-Walker Refractories Co.
Louisville Fire Brick Co.
Union Mining Co.

GAS AND GASOLINE ENGINES.
Power & Mining Mch. Co.

GAS PRODUCERS.
Duffs Patents Co.
Power & Mining Mch. Co.

GYPSUM.
American Gypsum Co.
Carolina Portland Cement Co.
Empire Gypsum Co.
Iowa Hard Plaster Co.
King, J. B., & Co.
Plymouth Gypsum Co.
Niagara Gypsum Co.
U. S. Gypsum Co.

GYPSUM MCHY.
Butterworth & Lowe.
Cummer, F. D., & Son Co.
Ersham, J. B., & Sons Mfg. Co.
McDonnell Boiler & Iron Works.

HARDENING CYLINDERS.
Alsing, J. R., Eng Co.
American Clay Machinery Co.

HOSE.
Mulconsay Company, Inc.

HYDRATING CYLINDERS.
Alsing, J. R., Eng Co.
Clyde Iron Works.
Kritzer, The, Co.
National Mortar & Supply Co.

HYDRATING MCHY.
Clyde Iron Works.
Kritzer Co., The.

IRON COLUMNS.
Mostberger-Langner Iron Co.

LIME.
Ash Grove Lime & P. C. Co.
Carolina P. C. Co.
Farman Cheshire Lime Co.
Fowler & Pay.
Goetz, Charles W., Lime & Cement Co.
Ohio & Western Lime Co., The.
Kelly Island Lime & Trans. Co.
Marblehead Lime Co.
Mitchell Lime Co.
National Lime & Stone Co.
National Mortar & Supply Co.
New Jersey Lime Co.
Pierce City Lime Co.
The Scioto Lime & Sone Co.
Western Lime & Cement Co.
Woodville Lime & Cement Co.

LIME, HYDRATED.
Ash Grove Lime & Portland Cement Co.
Ohio & Western Lime Co., The.
Marblehead Lime Co.
National Lime and Stone Co.
National Mortar & Supply Co.
The Scioto Lime & Stone Co.
Warner, Chas., Company.
Woodville Lime & Cement Co.

LOCOMOTIVES.
Davenport Locomotive Wks.
Ernst Wiener Co.

METAL LATH.
Carolina Portland Cement Co.

PNEUMATIC TOOLS.
Howell Mining Drill Co.

PLASTER MCHY.
Butterworth & Lowe.
Cummer, F. D., & Son Co.
Dunning, W. D.
Ersham, J. B., & Sons Mfg. Co.
Williams Pat. Crusher & Pulverizer Co.

PLASTER.
American Gypsum Co.
Carolina Portland Cement Co.
Empire Gypsum Co.
Iowa Hard Plaster Co.
King, J. B., & Co.
National Mortar & Supply Co.
Plymouth Gypsum Co., The.
Rader, Gustave, Co.
Sackett Plaster Board Co.
U. S. Gypsum Co.
Wheeling Wall Plaster Co.

PULVERIZERS.
Earnest Wiener Co.
Alsing, J. R., Eng. Co.
Kent Mill Co.
Lehigh Car, Wheel & Axle Wks.
Raymond Bros. Co., The.
Sturtevant Mill Co.
Williams Pat. Pulverizer Co.

RAILROADS.
Illinois Central R. R.
Monon Route.

RAILROAD MATERIAL.
Atlas Car & Mfg. Co.
Ernst Wiener Co.

ROOFING MATERIAL.
Carolina Portland Cement Co.

SAND.
Ottawa Silica Sand Co.
United States Silica Co.

SAND-LIME BRICK MCHY.
American Clay Wking. Mchy. Co.
American Sand Stone Brick Co.
Berg Mach. Mfg. C., Ltd., The.
Cleveland Brick Machy. Co.
International Sand-Lime Brick & Mach. Co.

SCALES.
Richardson Scale Co.

SCREENS.
Butterworth & Lowe.
Des Moines Mfg. & Supply Co.
Ersham, J. B., & Sons Mfg. Co.
Johnson & Chapman Co.
Power & Mining Mchy. Co.
Sackett Screen & Chute Co., H. B.

SEWER PIPES.
Buckeye Fire Clay Co.

SOAP STONE FINISH.
American Soap Stone Finish Co.

STEAM SHOVELS.
The Bucyrus Co.
The Vulcan Steam Shovel Co.

STUCCO RETARDER.
Chemical Stucco Retarder Co.
Ohio & Binns Retarder Co.

TAMPERS.
Anderson Manufacturing Co.

TUBE MILLS.
Alsing, J. R., Eng. Co.
Power & Mining Machy. Co.

WATER PROOFING.
Aquabar Co., The.
Barrett Manufacturing Co.
Carolina Portland Cement Co.
Chickamauga Cement Co.
De Smet, Geo. W.
Wm. S. Hotchkiss, Sales Agent.
Marblehead Lime Co.
Maumee Chemical Co.
Wadsworth, Howland & Co., Inc.

BOOKS FOR THE TRADE

Architects and Engineers

Practical Reinforced Concrete
H. B. Andrews. Price $2.00.

Analysis of Elastic Arches of Steel, Masonry and Reinforced Concrete
Joseph W. Balet. Price $3.00.

Theory of Steel-Concrete Arches and Vaulted Structures
Wm. Cain. Price $0.50.

Concrete Country Residences
Price $1.00.

Graphical Handbook for Reinforced Concrete Design
John Hawkesworth, C. E. Price $2.50.

Architects' and Engineers' Handbook of Reinforced Concrete Construction
L. J. Mensch. Price $2.00.

Concrete and Reinforced Concrete Construction
Homer A. Reid. Price $5.00.

Theory and Design of Reinforced Concrete Arches
Arvid Reuterdahl. Price $2.00.

Treatise on Concrete, Plain and Reinforced.
F. W. Taylor and S. E. Thompson. Price $5.00.

Concrete Engineers' and Contractors' Pocketbook
Wm. F. Tubesing. Price $1.00.

Principles of Reinforced Concrete Construction
F. E. Turneaure and E. R. Maurer. Price $3.00.

Concrete Steel
W. N. Twelvetrees. Price $1.90.

Handbook on Reinforced Concrete
F. D. Warren. Price $2.50.

General Specifications for Concrete Work as Applied to Building Construction
Wilbur J. Watson. Price $0.50.

American Engineering Practice in the Construction of Rotary Portland Cement Plants
B. B. Lathbury and C. Spackman. Price $2.00.

Cement and Lime Manufacturers

Manufacturer of Hydraulic Cement
A. V. Bleininger. Price $1.25.

Limes, Cements and Mortars, Concretes, Mastics, etc.
G. R. Burnell. Price $0.60.

Portland Cement; its manufacture, testing and use
David B. Butler. Price $5.00

Instructions to Inspectors on Reinforced Concrete Construction
Geo. P. Carver. Price $0.50.

Lime, Mortar and Cement
A. I. Dibbin. Price $2.00.

Cements, Limes and Plasters
Edwin C. Eckel. Price $6.00.

Practical Treatise on Limes, Hydraulic Cements and Mortars
Gen. Q. A. Gillmore. Price $4.00.

Mortars, Plasters, Stuccos, Concretes, Portland Cements and Compositions
F. Hodgson. Price $1.50.

Experimental Researches upon the Constitution of Hydraulic Mortars.
H. LeChatelier. Price $2.00.

Concrete Factories
Robert W. Lesley. Price $1.00.

Portland Cement; Composition
Richard K. Meade. Price $3.50.

The Constitution of Hydraulic Cements
S. B. Newberry. Price $0.50.

Manufacture of Concrete Blocks
Wm. M. Torrance and others. Price $1.50.

Practical Cement Testing
W. Purves Taylor. Price $3.00.

Notes on the Testing and Use of Hydraulic Cement
Fred P. Sutcliffe. Price $1.00.

Calcareous Cements
G. R. Redgrave & Charles Speckman.

"Portland Cement from a Financial Standpoint"
By Edwin C. Eckel C. E. Price $2.00.

Cement Uesrs

Foundation and Concrete Works
E. Dobson, Price $0.60.

The Uses of Hydraulic Cement
Frank Harvey Eno. Price $1.00.

Portland Cement for Users
Henry Faija and D. B. Butler. Price $1.20.

Cements, Mortars and Concrete
Myron C. Falk. Price $2.50.

Reinforced Concrete
W. H. Gibson and W. L. Webb. Price $1.00.

Concrete System
F. B. Gilbreth. Price $5.00

Hand Book of Cost, Data
Halbert P. Gillette. Price $4 00

Concrete Construction
H. P. Gillette and C. S. Hill. Price $5.00.

Cement Workers' and Plasterers' Ready Reference
H. G. Richey. Price $1.50.

Notes on Testing and Use of Hydraulic Cement
Fred P. Spalding. Price $2.00.

Reinforced Concrete
A. W. Buel and C. S. Hill. Price $5.00.

Concrete
Edward Godfrey. Price $2.50.

Reinforced Concrete
C. F. Marsh and Wm. Dunn. Price $7.00

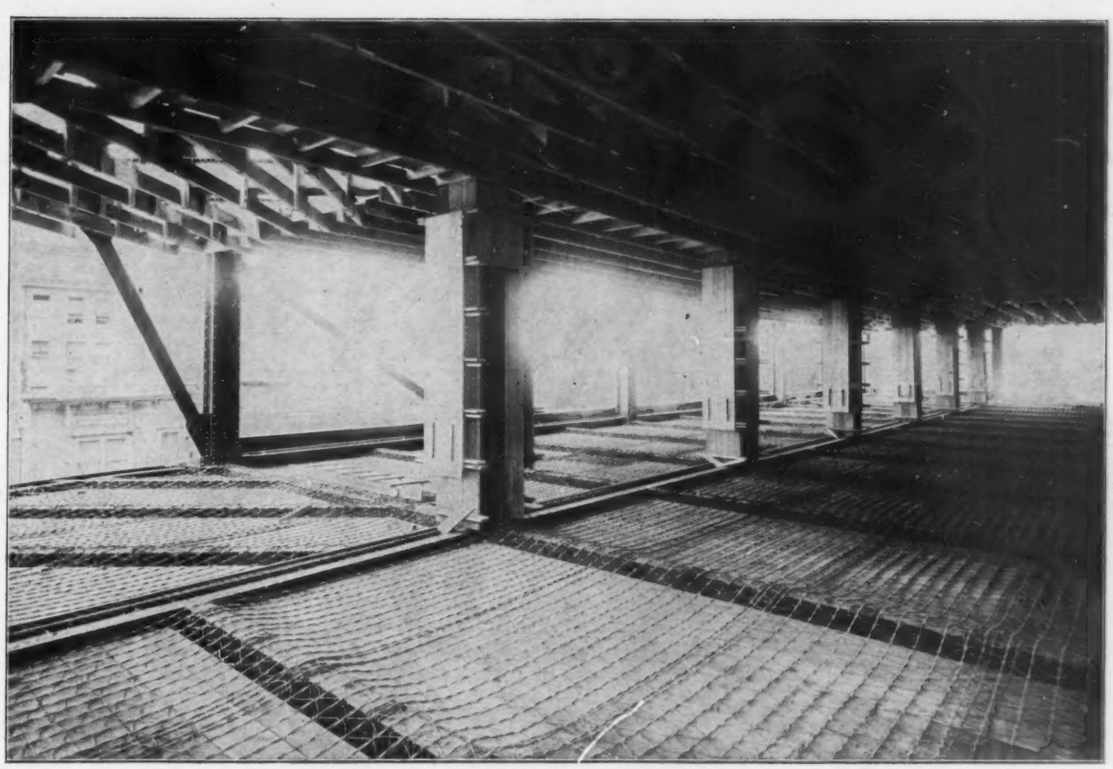
Practical Treatise on Foundations
W. Patton. Price $5.00.

Concrete
Thomas Potter. Price $3.00.

Cement and Concrete
Louis C. Sabin. Price $5.00.

ROCK PRODUCTS, 355 Dearborn Street, CHICAGO

Triangle Mesh Concrete Reinforcement



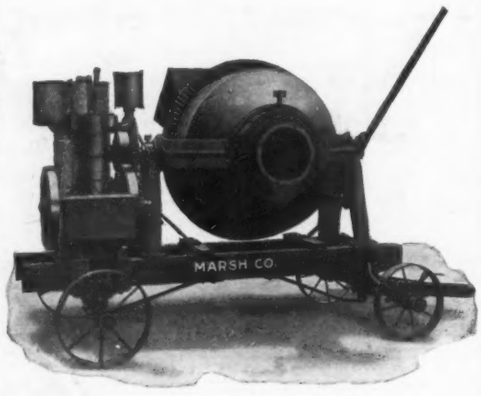
WHITE BLDG., SEATTLE, WASH. Built by Stone & Webster Eng. Co. Triangle Mesh [Reinforcement] Used.

Made by

American Steel & Wire Co.

CHICAGO, NEW YORK, DENVER, SAN FRANCISCO.

WRITE FOR ILLUSTRATED PAMPHLET.



Furnished with any combination of power and mounting, chain or gear connection at option.

Marsh-Dexter Mixer

We claim a lot for this machine.

If our claims are true you want to know it.

If you will write us we will tell you how to find out.

Marsh Company

903 Old Colony Building
CHICAGO

RAW MATERIAL GRINDERS

New Williams Universal

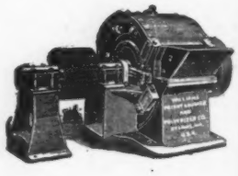
FOR TUBE MILL FEED

800 BARRELS 22 HOURS
95 PER CENT THROUGH 20 MESH
HORSE POWER 40 TO 50

WE ALSO GRIND
GYPSUM, LIME, COAL AND SHALE

Vulcanite Grinder

FOR ROLLER MILL FEED
TAKES MATERIAL FROM
GYRATORY, DIRECT



CAPACITY 20 TONS HOUR
FINENESS ½ IN., ¼ IN. AND ⅛ IN.
HORSE POWER 40 TO 45
1,300 MILLS NOW IN USE

WRITE FOR BULLETIN NO. 12

WORKS:
ST. LOUIS, MO.

The

SALES OFFICE:
OLD COLONY BLDG.
CHICAGO

Williams Pat. Crusher & Pulverizer Co.

San Francisco Offices: 428 Monadnock Building

Coltrin Concrete Mixers

No. 9 Coltrin with 2½ H. P. Engine

THE GAMER COMPANY, INC.
HEATING AND PLUMBERS' SUPPLIES
TANK AND TANK TOWERS
GAMER WIND MILLS

Ft. Worth, Texas, December 14, 1908.

DEAR SIR: Replying to your letter of inquiry, we are glad to say the work of your No. 6 Coltrin Mixer which was placed in our building is doing everything that you claimed for it, both in regard to speed and quality of mix.

Yours very truly, THE GAMER COMPANY,
Chas. Gamer, President.

WE SHIP THE COLTRIN MIXERS ON APPROVAL, ALSO P. B. MILES LATEST BLOCK MACHINE, THE OLIVER AUTOMATIC, AND A FULL LINE OF CONCRETE MACHINERY.

N. J. Morehouse
Waterloo, Iowa.

It's Time to Dig!

Brother Dealer, the welcome Springtime is again at hand—"the winter of our discontent" is over—life and business are again budding into promise!

¶ The Building World is blossoming into activity—and it's time for you to **go out into the Garden of Opportunity and dig!**

¶ You already have your business "garden" more or less cultivated—but when it comes to **plastering materials,** you can't plant more fertile seeds for a Bumper Crop of Business and Profit than the

U.S.G. Hard Plasters

Made from Pure Rock Gypsum

and **these Fast Selling Plaster Commodities:** Sackett Plaster Board, Gypsinite, Universal, U. S. G. Bond Plaster (for Concrete) U. S. G. Hollow Tile, Adamant (Cement for "Stucco Exteriors") Cementico, etc.

¶**Extend your garden of Opportunities**—as thousands of other live dealers are doing! Plant the live seeds—**let us help you plant them and make them grow!**

¶Enjoy the fruits of our Superior Quality brand, our Superior Service and our Cooperation!

¶Let's get out and dig—you and we! A postal card inquiry for information, Literature or Quotations, will start it.

Address our nearest office:

United States Gypsum Company

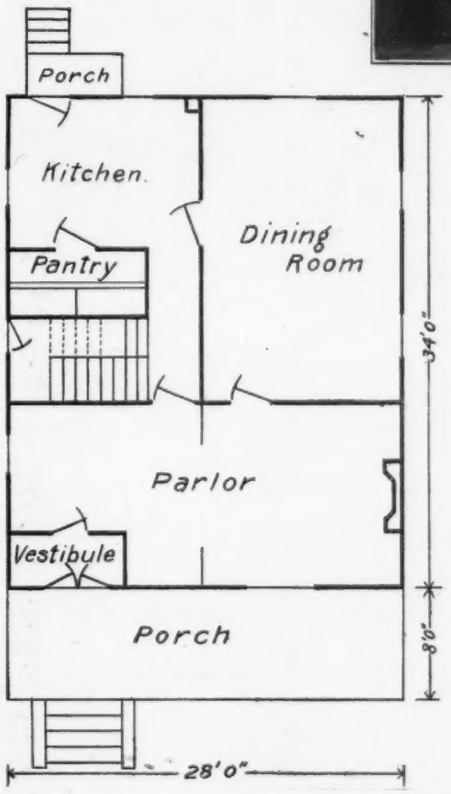
NEW YORK CLEVELAND CHICAGO MINNEAPOLIS SAN FRANCISCO

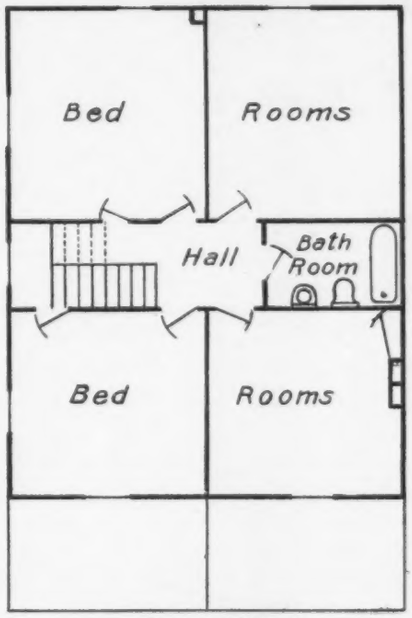
Low Cost Concrete Homes

The greatest obstacles to the use of concrete in small residence construction are: 1. The expense of form work and contractor's plant in reinforced concrete (monolithic) construction, and 2. The unsatisfactory appearance and poor waterproof qualities of concrete blocks made by the dry-tamp process. Both these obstacles have been overcome by

The Pauly Concrete Hollow Tile.

Full particulars with regard to the equipment of a suitable factory with the necessary machinery for any location will be cheerfully given, and a conservative and profitable deal will be exhibited for prospective manufacturers of concrete structural tile upon request.





Frank M. Ray's Residence
Youngstown, Ohio.

This residence is fireproof and waterproof. It was built in Youngstown, Ohio, fall of 1908, upon the following contract specifications:

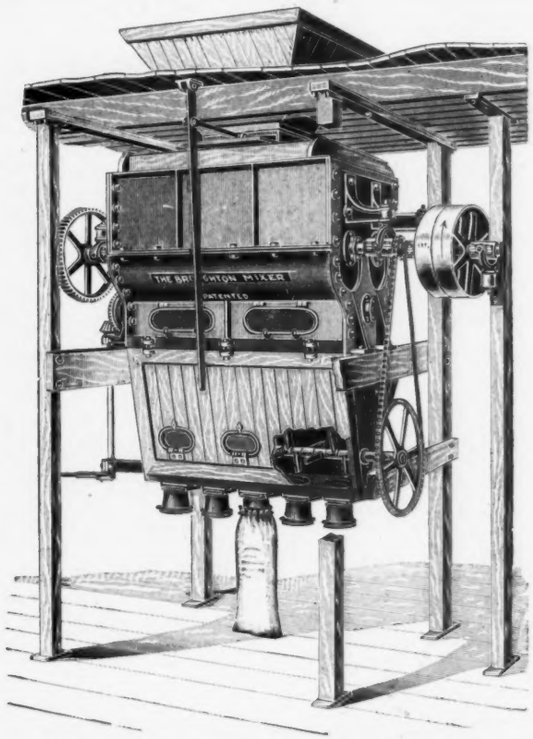
Masonry work complete, including selling price of tile, concrete floor extending under entire basement and combination tile and reinforced concrete floors...	$ 950.00
Excavation of cellar and construction of walks, steps, etc., outside of building proper	125.00
Lumber, hardwood lumber finish for interior and glass (including built-in furniture and plate glass mirrors)	1,000.00
Carpenter work	700.00
Slate roof and spouting	200.00
Plumbing in kitchen, bathroom and basement	250.00
Painting (exterior and interior)	125.00
Furnace and piping	150.00
Total plastering (including material)	200.00
	$3,700.00
Plus 10% profit	370.00
Total contract price	$4,070.00

The walks, driveway and steps, as well as the porch columns, are of concrete. It is sumptuously finished inside with hardwood, plate glass windows and doors with slate roof and six massive pieces of built-in furniture of elegant design, with plate mirrors, etc., all included in the figure named.

☞There is a good business opportunity in building homes of this type in any city. We furnish the entire machinery outfit upon the basis of a case.

Send for booklet showing a large number of houses built with this material.

CONCRETE STONE & SAND CO., Youngstown, O.



The most thorough and efficient Mixers of Plaster, Cement and Dry Materials. Send for Circular.

W. D. DUNNING, Water St., Syracuse, N.Y.

QUARRY AND CEMENT CARS

Double Side Dump Car built for 18-54 cu. ft. capacity and 24" to 36" gauge.

Our cars **Stand Hard Service** because the material that is embodied in them is of the best quality. The construction is of the latest and most approved type.

Our cast iron wheels have an extra high flange and broad tread which has a deep chill.

Let us quote prices on your requirements.

Large Stock of Cars, Rails, Portable Track, Switches, Turntables, Etc. Get our Catalog 17 and Stock List.

Agents for Industrial Locomotives of the Baldwin Locomotive Works.

RAILROAD SPECIALISTS FOR ALL INDUSTRIES.

ERNST WIENER COMPANY

196 Fulton St., New York, N. Y.

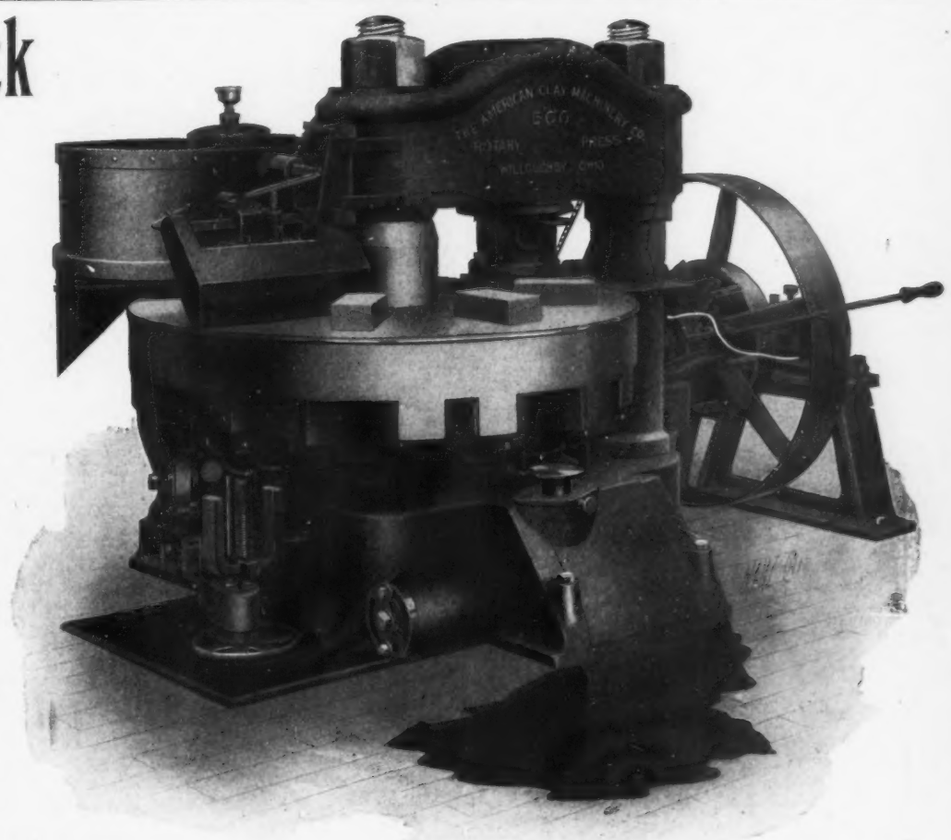
Denver, Colo—1017 14th St. Pittsburg—Union Bk. Bldg. Boston—141 Milk St.
Chicago—1540 First National Bank Bldg. Bisbee, Ariz.—P. O. Box 597.
San Francisco—202 2nd St.

Sand-Lime Brick Machinery

OUR Sand-Lime Brick Machinery is at least a little better than any other. We have testimonials to show it. We build it all in our own factory and are sure of its quality. We are the only firm doing this. We will design and equip your entire plant or will sell you parts of your equipment. Our catalog describing and illustrating our full line will be sent upon request.

We also build a full line of machinery and appliances for making Clay Products, Cement and Pottery, Dryers and Dryer Apparatus.

Everything we sell we make. We therefore know its quality to be right.



The American Clay Machinery Company

WILLOUGHBY, OHIO, U. S. A.